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COMPUTERWORLD

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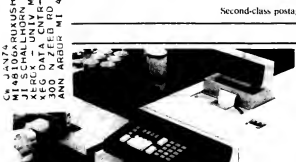

IBM Goes to Market

The IBM 3660 supermarket system features a fixed-head optical scanner that utilizes laser technology to read the grocery industry's new Universal Product Code. A point-of-transaction terminal can display an alphanumeric message up to 22 characters and print a customer receipt at 80 line/min. The terminal reports to an in-store controller with 28K bytes of memory and 5M-byte disk that acts as a link to a host 370. A communications unit can transmit the data from a store tu a central site at 2,400 bit/sec using either binary synchronous or SDLC line control. A typical system with eight terminals will cost about $118,000 with first deliveries scheduled for the third quarter of 1974.

House Pushing Privacy Board To Watch Data Bank Operations

By E. Drake Lundell Jr.
CW Washington Bureau

WASHINGTON, D.C. – A bill calling for a Federal Privacy Board to protect individuals against "improper, incorrect or unauthorized compilation or dissemination of information" from computerized data banks has been introduced into Congress by 27 members of the House of Representatives.

The bill, H.R. 9786, would apply to all data banks – state and local government and private – and is considered a companion measure to the Federal Privacy Act introduced by Rep. Edward Koch (D-N.Y.) that would require federal agencies to reveal the existence of data banks to affected citizens.

Like Swedish Law

The new bill – which is "virtually identical" to the Swedish law requiring the registration of data banks [CW, Sept. 19] – would require all operators of data banks containing information on individuals to register with the Federal Privacy Board.

Like the Swedish law the federal agency would determine what information could be kept in a data bank, how that information could be stored and to whom the information could be distributed.

In addition, it would prohibit the collecting and storing of information on criminal acts, medical records, welfare records, etc. except in special circumstances and would severely limit how such records could be disseminated.

The board would be made up of seven members, each of which would serve a two-year term. They would be appointed by the President with the advice and consent of the Senate, and no more than four members of the board could be from the same political party.

Any person keeping personal information on individuals and who failed to register with the board or who violated the provisions on what information was stored in his system or how it was disseminated could be liable to a fine of $5,000 or a year in prison.

The maximum fine could go up to $50,000 or 2% of the data bank operator's revenues in the case of class action suits, according to the bill.

National Policy Needed

"It is about time that the Federal Government establish a national policy regarding computers and computer abuses in the interests of protecting the privacy of our citizens," Koch said in introducing the bill.

"Computers are becoming a hydra-headed monster. No

(Continued on Page 2)

IBM Delays Second Virtual TP Release; SDLC Impact Expected

By Ronald A. Frank
Of the CW Staff

WHITE PLAINS, N.Y. IBM has delayed implementation of its Virtual Telecommunications Access Method (Vtam) and indications are growing that a major upheaval may be under way in the company's telecommunications software and hardware.

In a recent letter to prospective users, IBM said: "Availability of Vtam is delayed to provide additional time for testing and performance optimization and to better synchronize with support of the new Synchronous Data Line Control (SDLC)" [CW, Aug. 29].

The Vtam delay is the second this year for announced IBM telecommunications software. In June, the company admitted that Team level five, the first implementation of its Network Control Program, had been delayed from March to this fall. The new Team is now available, according to a spokesman, but users who had planned on using Vtam in their data processing networks will have to wait.

The first version of Vtam for DOS/VS had been scheduled for November but this has now been moved back until September 1974. And Vtam for OS/VS1 has been delayed from February to November of next year Vtam for OS/VS2 users will be available in March 1975 instead of June 1974.

(Continued on Page 4)

Survey Cites Materials Costs

Business Forms Prices Rise as Much as 18% in '73

By Marguerite Zientara
Of the CW Staff

Prices of business forms used in DP have risen from 3% to as much as 18% this year, and one forms manufacturer predicts a 50% increase in industry prices over the next two years, a recent *Computerworld* survey found.

Business forms manufacturers who have raised their prices said the foremost factors dictating increases are increased costs of their raw materials (paper, ink, chemicals) as well as decreasing availability of adequate paper supplies.

Four small manufacturers of business forms interviewed had raised their prices within the last six months, one by 5%, one by 8%, one by an unspecified amount and one by "nothing formal."

And heaping more coal on the fire, John Hess, general manager of Computer Papers, Inc., Des Moines, Iowa, said: "We're probably charging for some things that have always been in the price book that we've typically waived."

Most people in the forms industry have been selling at lower than list price, with special concessions such as fast-pay discounts and free marginal words normally worth $2 or $3. Prices were decreased by negligence as

(Continued on Page 4)

Judge 'Errs' on IBM Damages, Revision or New Trial Expected

TULSA, Okla. – Judge A. Sherman Christensen last week admitted his "computation of antitrust damages against IBM involved substantial error."

In the unusual move, Christensen said he would grant IBM a motion either to amend the finding he issued in the Telex-IBM case or else grant IBM a new trial on the issue of damages.

He said the decision on whether to grant a new trial on damages would be determined Tuesday, Oct. 16.

Several legal sources said the move might have been made because IBM and Telex are conducting serious negotiations on an out-of-court settlement. These sources suggested the judge

(Continued on Page 2)

NRMA Conference Told

'Future of Retailing' Lies in DP

By Edward J. Bride
Of the CW Staff

LOS ANGELES – The "future of retailing" lies in the use of computers, and specifically in the area of point-of-sale (POS) systems, most of which are now in the "infancy" stage of usage, according to speakers at last week's 15th annual EDP conference sponsored by the National Retail Merchants Association (NRMA).

While the concept of POS has finally been accepted by the retailing community and while elements of POS can be found in banking and in many other kinds of data-base systems, conversions are still difficult, they agreed.

POS, then, is reflective of the computer community five to 10 years ago, and this is interpreted as signaling a rampant growth, possibly accompanied by problems similar to those encountered with a new generation of computer equipment or with an on-line system.

Other coverage of the NRMA conference on Page 31.

Interconnection a Problem

Some elements of POS usage may be lagging behind the rest of the computer community, but other problems are shared on a contemporary basis. Data communications technology and the problems of interconnecting independent or customer-owned equipment with the transmission facilities of AT&T appear to rank near the top, according to conference participants.

William H. Borghesani Jr., NRMA telecommunications counsel, warned of the "federal-state confrontation of the first magnitude" regarding the North Carolina Utilities Commission's attempts to preclude interconnection.

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Bell Blasts Unfair Environment

FCC Tells Bell: Stop Delaying Specialized Carriers

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – AT&T has been told to stop delaying the services of the new specialized carriers to prospective users. But Bell, apparently feeling the sting of lost customers, continues to seek regulatory reconsideration of what it calls an unfair environment.

While the Federal Communications Commission was telling the Bell System to provide required local facilities to the specialized carriers' users, AT&T officially petitioned for reevaluation of the very FCC decisions that created Microwave Communications, Inc. and the other new carriers.

The FCC acted after AT&T said it would file interconnection tariffs with each of the individual states to provide local connections between specialized carrier facilities and their users' sites (CW, Oct. 10).

The commission told AT&T its plan to seek state approval for interconnections to interstate services being offered by MCI and other specialized carriers would be in "direct conflict" with the Communications Act of 1934, and the "policies and objectives of this commission" as set forth in the MCI, specialized common carrier and domestic satellite decisions.

Local Lines Critical

The local lines are especially critical to the specialized carriers since they must rely on local telephone companies to complete the links between their long-distance terminals and user installations.

In the past the Bell System has said it would provide these local loops when and where required. Some regulatory sources interpreted the AT&T plan to gain approval from each individual state as a delaying tactic to stall the specialized carriers.

In its strongly worded letter, the FCC said its previous decisions had "made it clear that Bell System companies and other established carriers which have monopoly control . . . would be expected to provide, on reasonable terms and conditions, interconnection of such facilities as required by the specialized carriers to terminate the services which . . . have been duly authorized in the public interest . .

"Effective implementation of our policy . . . requires that you promptly file [interconnection] tariff schedules with this commission . . . ," the letter said.

In the meantime, the commission said, there "should be no delay in honoring requests of specialized carriers for interconnection facilities . . ." Such facilities can be provided under contracts on an interim basis "and we assume this will be done."

AT&T Wants Reconsideration

The FCC decision authorizing the specialized carriers was reached without "full public hearings" and what has resulted is "contrived competition in which a few very large customers can enjoy lower rates at the expense of the vast majority of telephone users," AT&T said.

The new carriers are not offering any new or different services, "but only wasteful duplication of existing facilities and services," AT&T said.

In requesting the new set of hearings, AT&T suggested that the FCC consider the degree to which the established carriers have served the public interest and the long-term effects of the specialized common carriers.

Congress Expected to Approve New Privacy Bill

CW Washington Bureau

WASHINGTON, D.C. – The recently introduced legislation to establish a Federal Privacy Board may have greater chances of success than most privacy legislation in the past few years.

The bill has garnered strong support from both liberals and conservatives in the Congress and has been referred to the House Subcommittee on Civil Liberties and Constitutional Rights – and three of its members are cosponsoring the legislation.

In the past, the Federal Privacy Act, which would require federal agencies to notify individuals of records kept about them, has been referred to the House Committee on Government Operations, which has been slow to take any action on the measure which is still languishing almost four years after it was first introduced.

The Subcommittee on Civil Liberties and Constitutional Rights, however, is expected to take swift action on the new measure and hearings will be held on the bill either later this year or early next year.

In addition, there have been two recent reports on data bank operations that support the notion that some type of federal legislation is needed to protect individual rights in the operation of such systems.

With both the National Academy of Sciences and the Department of Health, Education and Welfare reports backing the need for regulation on a federal level, it will be hard for Congress to procrastinate on such legislation, one of the bill's supporters noted.

And since the new act is patterned closely after the Swedish law regulating data banks, the successful implementation of the measure in Sweden will also boost the bill's chances, he said.

"Up until now there has been more talk than concrete action in the area of privacy, but I think the time has finally come for Congress to act in this area," he added.

Bill Calls For Privacy Board

(Continued from Page 1)

amount of state legislation will ensure that residents of another state will be protected. We must have federal oversight in this matter," he added.

In addition, Koch stated, "the bill will not prevent the collection of valid data either by private or governmental agencies, but will impose reasonable controls on what can be collected or how it can be dispersed so as to protect the privacy of citizens."

Koch also indicated that the new measure will go a long way toward implementing some of the recommendations of the recent HEW Secretary's Advisory Committee on Automated Personal Data Systems.

Basically, he said, the act would implement the sections of that group's report stating there must be no personal data record-keeping systems whose existence is secret; that an individual must be able to find out what information is kept about him and how it is used; that individuals must be able to prevent the misuse of information; and that an individual must be able to amend or correct his record.

Koch also claimed the bill would fulfill the obligation that requires operators of data banks to insure the reliability of the data stored in them and to take precautions to prevent misuse of the data.

It's Called 'Shirting Real Issue'

By Patrick Ward
Of the CW Staff

PHOENIX – In a fast-changing world, will fire sales be replaced by computer error sales?

Diamond's department store here ran an ad recently that read, "Because a computer broke down . . . we can offer you a break on our very best selling name brand shirt.

"A computer can make human mistakes, too," the ad revealed, ". . . the kind that cause a very well-known shirt manufacturer to find out he had a whole lot more shirts than he had planned for . . . so they have to go . . ." "Sometimes," the ad concluded, "computer mistakes are nice."

But did a computer actually break down to cause a shirt surplus? Not exactly, according to the Arrow Shirt Co., maker of the shirts in question.

There was an oversupply of shirts, and it was a little heavier than normal for the time of year, but a computer breakdown did not cause it, according to Bryan Wordell, the company's western district sales manager.

Rather, he said, Arrow was just clearing its stockroom as the season ended.

"We are very computer-oriented," Wordell said.

Wordell did admit that human errors do appear from time to time in the company's computer operations, but nothing to cause warehouses to bulge with unexpected shirts.

But the store stuck to its guns. "Whatever appeared in our ad was information that was passed on to us from Arrow," said Duane Nathe, Diamond's vice-president and sales promotion director.

James Smith, the Arrow salesman who handles the store's account, does not recall "anyone saying that our computer broke down."

But, Arrow salesmen did mention their company's manual inventory had found more shirts than a computerized inventory had indicated, and, Smith said, that was where the surplus shirts came from.

Ships Kept Shipshape

LONDON – Lloyd's Register of Shipping is using computer technology today to help make the seas safer and cleaner for the seafarers of tomorrow.

One project of Lloyd's is the assessment of structural strength of marine vessels. By using the computer as well as research data, it is possible, according to Lloyd's, to estimate with a reasonable degree of accuracy the rate at which a crack will grow during the projected life of the material housing it and the size at which it will become critical for the structure.

Linked with computing facilities in Yokohama, Gothenburg, Rotterdam and Madrid, the firm offers design know-how for almost any size or type of ship.

Revision on Damages Against IBM Possible

(Continued from Page 1)

may have been indicating he would go along with a settlement that reduced the dollar damages granted to Telex.

In a second order Christensen outlined four questions the attorneys for each side should answer at Tuesday's hearing:

1. "To what extent should the amount of the trade secret counterclaim be offset against plaintiff's (Telex) actual damages prior to trebling?

2. "Beyond the amount and bases of the counterclaim judgment, can the competitive advantage secured by Telex through misappropriation of trade secrets be quantified on the present record?

3. "If so, should such competitive advantage as so quantified also be deducted from the antitrust damages before trebling?

4. "Are there economic data in the present record sufficient to permit a reasonable quantification of the effect of the injunctive relief granted against IBM upon plaintiff's damage projections and if so, what is it?"

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Calif. Hires Specialist

Insurance Examiners to Learn DP

By Marvin Smalheiser
CW West Coast Bureau

SAN FRANCISCO — The state Department of Insurance has hired a computer specialist to start a training program for examiners.

Dean Robinson, a 15-year veteran of data processing, said guidelines will be set up for examiners to use when they want to check out a company's data processing.

The training program for the department's 45 examiners will be set up shortly, said Robinson, a past president of the Computer Operations Managers Association of San Francisco.

For the past 15 months he has handled operations of DP service for the Pacific Coast Stock exchange.

Previously he was with DP operations at California insurance companies for 13 years.

Robinson was hired following a recommendation by an EDP committee named by Insurance Commissioner Gleeson L. Payne.

It was named following the Equity Funding Corp. of America scandal in which it was alleged bogus insurance policies were manufactured with the aid of the computer system.

"We're going to help the department get some expertise in data processing and computer technology so they can more effectively examine the DP departments in insurance companies we're responsible for," Robinson said.

"We will evaluate some software packages which will enable examiners to sample machine-sensible files and do analyses of them."

Robinson will be working for Christy Armstrong, chief examiner for the insurance department.

Robinson, he said, will be used not only for training and setting up guidelines, but as a staff resource, advising the department and examiners.

The training will be an ongoing program, Armstrong said.

Robinson said the main problem now is that examiners go into insurance companies and quickly find they are dealing with DP listings and reports with which they are not entirely familiar.

"We will try to remedy that," he added.

THE TIMESAVERS

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OTB Breakdown Laid To Failure of Drums

NEW YORK — If you think computers are a "sure bet," consider the day in August when the Off-Track Betting computers went down for three hours and lost $800,000 off the track.

Betting stopped completely in 112 parlors and through telephone accounts on three races scheduled for that day. The cause of the breakdown has not been fully determined, according to a spokesman for American Totalisator Co., which does OTB's computer work on a Varian 620 L100 processor.

According to Irving Rudd, public relations publicist for OTB, the failure was due to the "simultaneous failure of two drums in the computer." He said there was a "trillion-to-one" chance of both drums failing at the same time, and he considered the breakdown as "disastrous and total" as the Northeast blackout of several years ago.

Normally one drum subsystem served as backup for the other, and a problem in one was transparent to the system.

"When there are no computers working there is no betting service," Rudd said. "It would be too costly to keep a manual backup system in reserve."

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Business Forms Prices Increase as Much as 18% in '73

(Continued from Page 1)

many suppliers "overlooked" charging for special services.

Jim Stanton, marketing manager for International Business Forms, which raised its prices 8% in March, cited the phasing out of the cheaper grades of material by the suppliers as one of the major reasons for International's price increase.

After United States Business Forms of Bartlesville, Okla., absorbed three price increases on materials, according to Berky Irwin, assistant marketing manager, "we couldn't stand it any longer," and put on a 5% surcharge in August.

Labor Costs Up

In addition, labor costs are contributing to the price increases, although far less than the price of paper, according to Florence McDonald in the dealer sales department of Systematic Business Products, Paramus, N.J.

All of the smaller manufacturers agreed that prices can go "only up" and basically because of material increases. Computer Papers, Inc., which specializes in custom forms, predicted prices would be up "at least 50%" in the forms industry as a whole.

Two users who said they were having good luck with their suppliers cited Uarco, Inc., Barrington, Ill., as a major or sole supplier.

Ford Motor Co. in Dearborn, Mich., claimed it has had no trouble getting business forms lately, has experienced no price increases and has not been forced to higher grades of paper by Uarco. The reason for such treatment, according to Charles Gump, manager of DP services, is that Ford has signed a sole-supply contract with Uarco.

United Airlines, headquartered in Chicago, also gets the majority of its supply from Uarco, according to Gary Helitsch, graphic arts buyer. The airline has had no problems getting forms and has experienced only a 3-1/2% rate increase in six months. Recordering lead times have been extended two or three weeks beyond the usual four weeks, Heitsch said, but on the whole, there has been "no substantial inconvenience" for the airline as far as its business forms supply is concerned.

A spokesman for Uarco said the firm "has complied with the regulations of the price board."

Standard Register Co., with only a 3% increase in the list price on selected products, effective last April, is "trying to hold the line on prices to our customers all we can in the face of increasing paper costs," according to Will B. Rodemann, vice-president of marketing. The firm is finding it very difficult to get paper, Rodemann said. "It requires scrambling all the time by our purchasing people."

Rodemann echoed the assertion that the industry has been selling below list levels since the early 1960s, but said that Standard Register's overall average net prices are still "very much" below its catalog list level.

On the other hand, Morely Co. of Portsmouth, N.H., has had an 18% overall increase already this year, according to Fred Taylor, marketing manager, "Since the end of July, we've been holding the prices for our regular customers for 60 days. They were changing from every 10 to 30 days," management said in July. "We've had another increase since then but I've held on my steady customers."

The problem, according to Taylor, revolves around carbon as well as bond paper. "We're looking around, like everyone, with carbonless paper to see if we can get around that, but nothing in there yet," he said.

Moore Business Forms of Niagara Falls, N.Y., instituted a 5% price increase in July and, according to company representative Chuck Scott, can probably look forward to a 5% increase every six months. "The paper mills aren't giving us any notice," he said. "They're sending what they have and telling us the price."

Among users whose suppliers' prices have gone up, Procter and Gamble, headquartered in Cincinnati, Ohio, has experienced a "drastic" increase of 10% to 20% in the last six months, according to Gary Perkins, supervisor of data I/O services. Perkins attributed the price increases to a shortage of pulp and an increase in demand for forms. Procter and Gamble's lead time has been moved up from about two weeks to a month, Perkins said.

Prudential Insurance Co. of Boston has experienced a 25% to 35% price increase and a lead time extension of a month, according to buyer Frank Fitzmaurice.

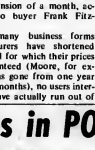
While many business forms manufacturers have shortened the period for which their prices are guaranteed (Moore, for example, has gone from one year to three months), no users interviewed have actually run out of paper because of it.

In an effort to trace the problem to its origins, CW talked with representatives of two large paper manufacturers, both of whom preferred to remain anonymous. The major reasons given for the tight paper supply were:

- A major pulp shortage.
- A number of paper mills have been closed down because of antipollution costs.
- There are few new paper machines because each machine costs $60 million to $80 million, and companies have gotten a low return on the investment in recent years.
- A new, far greater demand for paper than the capacity for making it allows.

And there is little relief in sight. Most paper manufacturers, business forms manufacturers and users predict a continuing tight market and, in the words of one spokesman, "Prices are going to go up just as high as the market will permit and the government will allow."

'Future of Retailing' Lies in POS Systems



Moses Shapiro

(Continued from Page 1)

This attempt amounts to a bid to nullify the 1968 Carterfone decision, the attorney said.

While this attempt could impact all data communications users, it is especially significant for those considering POS, since most of these systems include a minicomputer that communicates with a larger regional or corporate-owned system, speakers commented.

Borghesani recalled that Clinton D. Warkow, attorney for Montgomery Ward, told a Senate antitrust committee that Ward had found interconnection and the use of non-common-carrier equipment "of great value," indicating that the special features, service and lower rates of independents had saved Ward over $1 million per year.

NRMA has lobbied and is continuing to give testimony to the various committees studying the North Carolina situation, particularly the Federal Communications Commission.

Sears Speaks Out

Sears Roebuck, considered by some to be in the forefront of POS usage with an extensive national system, was among speakers from both the policy-making and operational levels to discuss various aspects of POS.

Jack Miller, national director of data processing, said the most important aspect of these systems is with inventory control.

Richard R. Callahan, regional controller for Sears in the Los Angeles area, commented that POS represents a great opportunity to reduce accounting errors and errors originating from human or manual input.

There has been enough experience with POS to pinpoint some trends or commonly held beliefs as unsuccessful characteristics, the Sears group contended.

For example, Miller pointed out, the "wand reader" for sales tags represents the most accurate and speedy device for entering information. Once the brief training cycle is passed, accuracy approaches 100%, Callahan added.

On the other hand, less expensive, more mechanical means for data entry, even keying in the data, are possible if shorter stock numbers are used, it was noted.

IBM's Blessing?

The phenomenon of "IBM's blessing" was dismissed by Moses Shapiro, board chairmen of General Instrument, manufacturers of the Ultimate system. He referred to IBM as a "Johnny-come-lately" to the POS arena.

Shapiro said the current makers of POS equipment did not need "IBM's blessing" in order to promote acceptance of POS. He said this aspect of computer usage had been "off and running" for several years.

While Shapiro's statement may be true, it was also noted that one of IBM's strongest holds is in the retailing market. It was estimated that as many as 85% of the department stores with computers have IBM computers.

2nd Virtual TP Release Delayed, SDLC Impact Seen

(Continued from Page 1)

the CPU will be programmed for half-duplex operation.

There is some doubt how effective these microcontrollers will be since the benefits of SDLC cannot be realized on the mainframe without extensive modifications of access method software. Whether this problem is related to the announced Vtam delay is not known.

SDLC is also expected to play a major role in the operation of teleprocessing networks which make use of satellite links. By operating in continuous full-duplex mode, SDLC equipment will eliminate the troublesome line turnaround delays now encountered on airborne data links. With existing line control methods, special software is required to overcome this problem.

In delaying both Tcam and Vtam, some experts believe IBM telecommunications software experts are encountering significant problems with implementing communications control methods in a virtual environment. This could explain IBM's silence on releasing any additional details on SDLC or what it will mean to the user.

SDLC Due When?

The first implementation of SDLC is now scheduled for "fall 1974" but this also may be subject to change. The first use of SDLC, a full-duplex line control, will be on the 3704/3705 and ends but IBM undoubtedly will announce a new family of terminals and other communications hardware to utilize it. One of the problems users will face is that current binary synchronous devices will not be compatible with SDLC or its equipment.

It is believed IBM will introduce a series of microcontrollers to implement the SDLC line discipline on existing buffered terminals and other programmable communications devices, according to industry experts.

These microcontrollers will operate "out close to the modem," according to one source, because existing line control between the front end and

DP Intended to Amplify, Not Replace, Management

LOS ANGELES – The next decade may bring back house calls by doctors, equipped with portable computer terminals for remote access to medical data bases, according to F.G. "Buck" Rodgers, vice-president and director of marketing at IBM.

The data bases will include diagnosis of ailments and suggested remedies, and will be accessed through telephone lines, he predicted.

Addressing a luncheon gathering during the National Retail Merchants Association (NRMA) annual conference, Rodgers said businesses are finally beginning to use computers as they were originally intended – to amplify, rather than replace the management process.

"As we get more applications-oriented," he commented, it is necessary to keep social goals, and not just "bottom line," as management objectives.

In fact, the greatest changes of the next decade, he predicted, will be in the field of management. No longer will decisions be made strictly on the basis of fundamental data with profit as the key motivation, but rather with people in mind.

Business needs to adopt the precepts of respect for the individual, dedication to service, and a struggle for excellence ("a corporation has the right to expect the best of its people"), if it is to succeed, he stated.

Calling mediocrity a "natural" but "insidious" disease, Rodgers said there is no substitute for human relations. He also said business must educate its people and retrain, where necessary, so that the "why's" of decisions are known (not just the "how's" of implementing the policy).

NRMA Attendance Sets Record

LOS ANGELES – Attendees at last week's National Retail Merchants Association (NRMA) conference here represented both EDP and corporate management, as well as operational personnel, and a new attendance record of about 700 was set.

Irving Solomon, NRMA vice-president, said computers in retailing, and particularly point-of-sale (POS), were experiencing rapid growth, and he added that next year's conference will probably accentuate "point-of-receipt" systems.

Five firms that market POS equipment and/or services to retailers displayed their wares in separate meeting rooms during the conference. NCR, AT&T, American Regitel, Interface Mechanisms, Inc. and Unitote all had POS gear or related equipment on display.

Additionally, workshops were conducted by other suppliers who did not bring hardware, and these included Singer and IBM, which attracted standing-room-only crowds, as well as Sweda, Pitney-Bowes and Data Source Corp.

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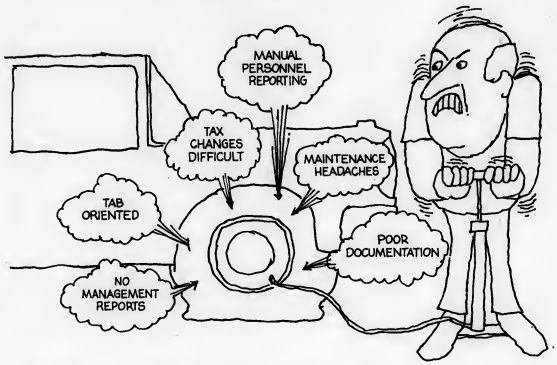

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Security Conference Told

Users Most Liable to Fraud Now

By Edward J. Bride
OF the CW Staff

The aftermath of the Equity Funding fraud goes far beyond the Los Angeles data center of that company. It has spread to the auditing and the security communities, and quite probably to the rest of the computer community.

And Donn Parker, the Stanford

Williams

. . . "Management Innovation"

Research Institute's specialist in computer crime, believes computer users have never been more vulnerable to fraud and embezzlement than they are presently.

At the annual conference of the American Society for Industrial Security, Parker noted that in the future, computer users may be safer than they are now. But for the near term, there is great vulnerability, Parker claimed at the New Orleans conference.

In Philadelphia the following week, the fledgling Eastern States Association of Bank Data Processing Auditors (ESA/BDPA) hosted a meeting during which many speakers called for close monitoring of DP procedures and for a higher degree of professionalism among DP auditors.

Banks have "only just begun" to use automation effectively, according to one speaker, who noted that computerization of bank transactions "will provide fewer audit trails than existed in the past."

Thomas W. Williams, senior vice-president at Wachovia Bank and Trust Co., said that because of increasing amounts of data transmission, control over I/O will become more complicated.

What Has Equity Wrought?

With society becoming more complex, along with computer technology, there will be less reliance on the human element in data processing.

"Management innovation" is a must, he said, since lower-level people would be "pushed to the wall" as far as temptation is concerned. With credit plans easy to use and with technology facilitating embezzlement and other forms of theft, it is vital to review personnel to assure that performance of specific duties is according to company policies, Williams said.

The DP audit, Williams continued, is becoming more difficult with the more complex software and systems.

EDP audits can best be performed by people with training in both computing and auditing, according to Chuck Coen, principal bank counselor for the Bank Administration Institute (BAI) which cosponsored the meeting with ESA/BDPA.

Describing BAI's standards for internal auditing, he said individual proficiency is the keystone, since no other elements could exist without the ability to do a good job.

The other areas of auditing apply both to the auditor and to his relationship with others in the corporate structure, Williams noted.

For example, an auditor must perform his skills to the best of his ability, and schedule his work properly, as well as examine internal controls, documentation, plus the reporting structure within the company – all of this while retaining independence of the operational personnel being audited, he noted.

CW Photos by Edward J. Bride

Coen

. . . Individual Proficiency

Coen drew support from Homer B. Lovvorn, senior vice-president of the North Carolina National Bank, who said that aside from the assignment of competent personnel for audits, both the executive management and the division being audited must want an effective audit program.

Lovvorn noted that an audit program he helped organize experienced difficulties because of insufficient resources, in both money and people, as well as a lack of management education on the benefits – and the ongoing progress – of the audit.

One of the statements made at the earlier security meeting in New Orleans related directly to the auditing conference in Philadelphia. Peter Browne, superintendent of the DP executive office at State Farm Mutual Automobile Insurance Co., said 100% security is impossible to attain, but risks (physical or otherwise) must be reduced to an "acceptable level."

Browne and Parker both contended that computer-aided thefts generally are exposed by controls not related to data processing.

And at the auditing meeting, another speaker stressed that if

(Continued on Page 7)

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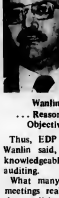
Users Most Liable to DP Fraud

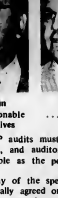
(Continued from Page 6)

objectives are not attainable, then auditors have "wasted our time."

Richard C. Wanlin, director of the program planning division of the Office of the Comptroller of the Currency, said any program being governed by the philosophy of management by objectives must be governed also by "reasonable" objectives.



Wanlin
. . . Reasonable Objectives



Lovvorn
. . . Training Time

Thus, EDP audits must be workable, Wanlin said, and auditors must be as knowledgeable as the people they are auditing.

What many of the speakers at these meetings really agreed on was the fact that auditing, security and many other DP functions rely more on people than on technology.

They did not agree whether solutions to the current threats could be found first in people or machines – a combination of approaches seemed the solution.

But repeatedly, fears were expressed that an Equity Funding could happen to the banking field and many other areas of computer usage, such as retailing and credit bureaus.

Security Checklist: Fire Prevention An Involved Process

TORONTO – Is your computer installation secure? Or is it vulnerable to costly damage from the hazards of fire, floods, mechanical breakdowns, fraud and lost programs and data files.

A simple way to determine the security of your computer system is to check it against the following security "musts" concerning fire prevention and protection:

- Have qualified personnel inspect the computer center to see if it is divided into segments for fire control purposes with all partitions made of fire-resistant materials.
- Equip all areas of the computer room and library with ionization fire detectors, connected to automatic alarms and extinguishing systems, to protect against localized fires in data processing equipment.
- Have the installers test these detection systems every six months.
- Install audible alarms which can be manually reset by the fire department in case of a false alarm or in case of a small fire which can be put out with portable fire extinguishers.
- Equip the computer center with an automatic sprinkler system and a gas flooding system, such as Halon.
- Consider a sprinkler system which shuts off automatically.
- Equip the computer room with portable carbon dioxide or other gas fire extinguishers to combat machine or electrical fires.
- Inspect fire extinguishers regularly to ensure that the seals are not broken. Have qualified personnel periodically determine if they are charged.
- Train computer center personnel to use portable fire extinguishers.

This checklist was compiled by DCF Systems Ltd., 74 Victoria St., Toronto, Ontario M5C 2A5.

Keep Current to Beat Fraud

PHILADELPHIA – Computer users are most vulnerable to fraud around the time of a hardware or software failure.

This was one of several problems of computer users, especially banks which use DP techniques to manage and transfer money, reported by Homer B. Lovvorn, senior vice-president of the North Carolina National Bank.

Among the other considerations he elted were personnel training and technology itself. He made his remarks at the conference of the Eastern States Association of Bank Data Processing Auditors.

Restoration of data integrity after a hardware or software malfunction is crucial, Lovvorn commented, since "smart crooks" will find weaknesses in systems during such times.

One of the biggest problems facing banking users relates to this first situation, namely how to keep the EDP audit staff current, in view of a changing technological environment.

A simplified answer would be to devote sufficient time to training, he noted; the problem is that, according to Lovvorn's definition, "sufficient" means 15% to 20% of a person's time being devoted to off-site education.

This is "necessary for a healthy, responsive EDP audit function," he commented.

As for technology, Lovvorn found that ever since the American Bankers Association adopted the magnetic stripe as a standard for credit cards and other financial media, attempts have been made to show the weaknesses of that standard.

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Editorials

'Media' Implies a Medium

Computerworld is scouring the North American bush for paper supplies. We are struggling with newsprint shortages and the Canadian strike; as indicated elsewhere in this issue, business forms manufacturers are having problems with high-quality stock.

It all points up the continued importance of paper in a supposedly all-solid-state world. Space technology lets us call London or Lima via satellite, unimaginable to anyone except Arthur Clarke 20 years ago. But the telephone company still bills us on paper. *And* with e punched card!

Guide Says No

Computerworld recently asked Share, Guide and Common to be allowed to peek under their respective tents. Perhaps the camel image associated with the CW Caravan, and nose thereof, militated egeinst ecceptance. Common refused quite promptly. We have just had e formal refusal from Guide. Nothing from Share so far; perhaps they have lost our address.

How Much More Nail-Biting?

Let Us Now Praise Systems Analyst, the Risk-Taker

By George K. Staropoll
Special to Computerworld

If it were not for the insurmountable change affecting the user, systems analysts would not exist. It is the systems analyst who is responsible for the management and control of change – of the variety of conditions, events and developments affecting the firm.

The systems analyst is responsible for responding quickly and effectively to change in order to keep pace with the increasing competitiveness of today's business, and for developing a meaningful, effective and efficient system to enable the user to better meet his objectives.

His systematic approach, using the numerous management science techniques, provides the methodology by which he arrives at the solution to the user's problems. Yet, there are still decisions that must be made, and risks to be taken in the exercise of judgment, that cannot be reduced to a systematic solution; namely, those questions arising from corporate policy interpretation, the relative importance of background material, the effects of changes and developments on the solution and the urgency of the solution.

How the systems analyst chooses to deal with these risks depends upon his environment and his own lifestyle. He may choose the safety of the bureaucrat or accept the challenge as an entrepreneur.

Bureaucratic Systems Analyst

The bureaucratic systems department has its origins somewhere in the past when it went astray, perhaps leaning too much in one direction; such as building better mousetraps at exorbitant costs, or paying too little attention to the user's real wants.

The normal reaction is one of: over-control, the preeminence of adhering to standards and procedures, the "review" that focuses on how well procedures were followed and the normalization and conformity of method, approach and thought. Raises and promotions are considered as compensation for work already performed. Results are measured in regard to policy, plans and procedures.

As for the analyst himself, he may have been caught out on a limb once, and now seeks the safety and low-level risk afforded by a clearly defined book of rules – the systems and procedures manual.

The "what to do," "how to do it" and "why it should be done" are precisely defined by the requirements of the proposal study, report or specification documents.

"A study proposal must be submitted before . . ." and "We did not consider it because this problem was not specified in the study proposal" involve little risk-taking and conflict, for they are justified by recourse to "chapter and verse." To deviate from the established procedures is to assume an unnecessary risk, for the analyst is judged not by the results obtained in spite of the risk, but by adherence to standards. He is paid to follow orders and not to take risks.

If he fails in his calculated risk-taking, undertaken because the expected results justified the degree of risk assumed, he is ruined – his reasons are not recognized by management.

The lifestyle of the analyst is characterized by passivity, defensiveness, reaction rather than action, and "you get what you pay for from nine to five." He is a tired, unconcerned, "burned-out" analyst, whose visibility does not extend beyond the internal requirements of his department. His systems analysis and new systems design are just a scene instead of a scenario – he is not a visionary.

Entrepreneur

In contrast to the bureaucrat, the entrepreneurial systems analyst seeks opportunities and is willing to accept well-calculated risks in order to bring economic benefits to his firm.

The opportunities and potential benefits lie outside the systems department and are depicted in the scenario of his study, reports, proposals and specifications. He insists on being measured in regard to results, not adherence to internal standards.

The entrepreneurial-oriented analyst is also a dynamic, imaginative innovator who identifies with and internalizes the objectives of the user. He exhibits a "we" rather than a "they" attitude.

Raises and promotions are considered by the analyst as an investment in his potential and not as a compensation for services performed. He is a costly resource to be fully utilized. When offered a challenge, he will respond.

There is a firm belief in management by objectives and an insistence on being measured by his success in meeting these objectives. For his reviews, he would rather submit a statement of his activities during the past year, including both quantified and impressionistic data.

This performance report would emphasize the results obtained in meeting his objectives and the significant decisions that had to be made. The analyst expects to be cross-examined, but not rated.

Being entrepreneurially oriented should not be associated with the permissiveness of "doing your own thing." The dynamic creativity of the analyst is under control throughout the development process; it is calculated to produce goal-satisfying results.

Management, if it is to respond rapidly and effectively to the variety of change affecting the firm's economic position, must seriously consider what it expects from its systems analysts.

The environment in which the analyst is to operate, as well as his approach, are factors that influence the systems department's ability to meet management's expectations. The question is: What does management want? Highly structured behavior patterns or highly successful business systems?

The author of this article had its origins in *Entrepreneurial Management*, Charles A. Dailey, McGraw-Hill, 1971.

Staropoli is a systems analyst with the Chase Manhattan Bank.

Editor's Note: It is realized that Viewpoint articles by their very nature may be controversial. Readers are encouraged to comment on these articles, and to submit material on subjects that can affect EDP managers.

The Social Cost of Data

Last week I attended a committee meeting of Safe, one of the IBM-sponsored projects on computer privacy and security. This particular one is based in the Department of Finance of the State of Illinois. I was allowed to contribute to the wide-ranging discussion, although I tried to be a good boy and not interfere with the real workers.

What impressed me enormously was the willingness of several of the senior people present, notably Ted Climis of IBM, to look at the total cost of data systems. Not just the obvious hardware, software and overhead costs; not just the startup and training and propaganda costs; not just the costs of transforming the business or the university or the government department as a result of analyzing the results – this group was willing to rather calmly discuss the social, the ecological, the antipollution costs of data.

Suppose a state motor vehicle bureau sells tapes of car and boat registrations to gadget vendors, insurance salesmen and the DAV. Suppose the sale is permitted by the absence of prohibiting law, or is explicitly sanctioned. And suppose that new privacy legislation requires expungable mailing lists, or even the securing of permission from the vehicle owner to be circularized. Obviously the cost of direct mailing will increase very considerably.

It was the consensus of our group that the cost of using data in a socially acceptable way was, like the cost of antispill precautions in an offshore oil site, a necessary part of being in the data-consumption business.

We felt that the costs of privacy and security, the costs of treating the consumer with courtesy and with individual care, the costs of providing access and correction facilities for personal records, were necessary costs of using data: that private and public organizations should, and will ultimately be forced to, assume their fair share of these charges.

The idea is, of course, not new. I thought of Joe Weizenbaum as we talked, for instance. What impressed me was that not just computer people, not just senior business executives, but even *lawyers* were willing to discuss a Naderist issue. In this narrow but deep region of human concerns, all is not yet lost.

A Word About Microneumanns and Nanogrosches

By Michael F. Morris
Special to Computerworld

P.A. Zaphyr's letter [CW, Aug. 29] commenting on my "speedometer" article [CW, July 25] goes directly to the heart of the matter.

We have no units with which to measure and we do indeed presume much when we call our subject a science. I think, though, we go too far when we begin a discussion of whose name we should honor before we have even thought about what our basic units should define, let alone what the units themselves will be.

I feel very pessimistic with regard to how soon we will have a "microneumann" or a "kilovonneumann," or, while we're playing, even a picoazphyr, nanogrosch or micromorris. I'm afraid we're so far from a unit for our "science" that all of these personalities and their great, great grandchildren will have long since been moved to "write-only" memory before anyone will need to worry whose name should be used for the basic unit.

My reason for believing this way has been put on paper already in a preface to a chapter on hardware monitoring in a book titled *Computer Performance Evaluation* which Paul Roth and I are now writing for the Auerbach Publishing Co. The book will not be in print until mid-1974 so I will break the

Viewpoint

rules of good taste and humility and quote my own unrefereed manuscript:

"Instrumentation has been an integral part of virtually every complex machine devised by man. Measurement of the performance of machines is usually quite simple.

"There is little or no ambiguity regarding the meaning of the information obtained through instruments developed to communicate performance of any type of machine that exists or that can be imagined – except one. Unfortunately, this one exception is computing machinery.

"It has long been a matter of historical interest that computers are truly unique among machines. All other machines serve to multiply physical power. Computers serve primarily to multiply mental power.

"Man's understanding of physical power is essentially total while of mental power we understand almost nothing. The "Table of *Selected* Weights and Measures" in the Encyclopaedia Britannica (Vol 15, pp 138-142, 1957) lists nearly 400 units from "acre" to "zolotnik" that are now in international use.

"All are physical units. The closest thing to mental units are the units of MA and IQ scales. Both mental age and intelligence quotient are, at best, crude approximations of mental power. Neither has an independently definable basic unit.

"The reservations implicit in these observations apply to every tool of computer performance evaluation. These remarks are made in introducing this chapter on hardware monitors because these monitors are the closest thing to instrumentation for computers that has yet been developed.

"Information obtained from such instruments enjoys a very high level of both acceptability and credibility for the philosophical reasons alluded to above. It must be understood that hardware monitors have no capability to measure that unique capacity which computers provide to mankind.

"The basic issue of suitable units for describing computer performance may have to await resolution until fundamental discoveries are made that allow a complete a description of mental power as can already be made of physical power.

"One hopeful counterexample to this extremely pessimistic viewpoint might be made with electricity: even though no one knows what electricity is, there are basic units that adequately describe its performance and allow us to control it.

"However, electrical units describe only the physical characteristics of this power and it is difficult to imagine a mental characteristic describable in electrical units that would be within the bounds of "respectable" science.

"Having spent perhaps too many words to make the point that computer performance evaluation is at least two levels of abstraction away from a well-founded measurement, no further space will be used addressing what should be the really basic issue. It is hoped that philosophers will do a better job with this issue when they have the time to devote to the contemplation that practitioners can't afford."

That's why I think Zaphyr indeed saw through the trivia of the "speedometer" article and put his finger squarely on the real problem of our "science." But, in the interest of not wasting the next few millenia on naming our unknown units, let's press on with potentially useful trivia until our real Voltas, Watts and Ohms make themselves known to our descendants.

One final item raised in Zaphyr's letter: there is at least one effort under way toward the development of a sound theoretical foundation for our "science." Kenneth Kolence, co-founder and past president of Boole and Babbage, the software monitor firm, is developing an analogy to classical physics which he calls "software physics."

Editor's note: CW is certainly aware of Kolence's "software physics" [CW, July 11], but he is reluctant to have a lot of coverage until he has completed a report for the National Bureau of Standards. He expects that to be done in early 1974.

(Michael F. Morris is with the Federal Computer Performance Evaluation and Simulation Center, Washington, D.C.)

Who Took My Cash? Was It Blue Cross or My Bank?

A man once got up at a DPMA meeting I was addressing and told me I was a liar. "These computer mistakes you have been talking about," he said, "may have happened to different people around the country, but they all could not have happened to you. That's just not possible."

Well, I am sorry to say, in fact, they all happened to me. And while I strive to keep as far from computerized systems as possible, I still find the results of system errors and problems in my own mail far too often. Here is an account of some late developments just as they occurred.

The Taylor Report
By
Alan Taylor, CDP

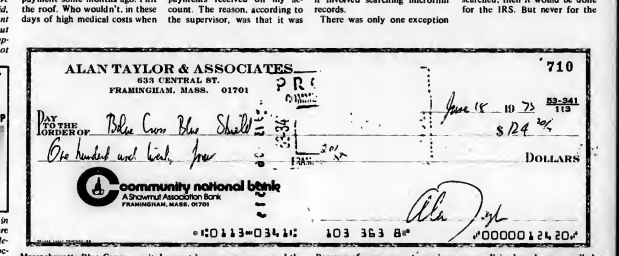
Massachusetts Blue Cross & Blue Shield holds all my family medical insurance. A National Shawmut Association Bank handles all our banking business. As a result of past experience, I could never completely rely on what either of these firms said about my accounts and I have characterized their systems as both arrogant and inadequate to meet the needs of their subscribers and depositors.

What I had never realized until recently, however, was that these two systems can directly interact – and leave me knowing that one of them – I don't know which – has taken $124.20 from me and left me uninsured.

I only found out about the whole matter by chance, three months after it actually happened. I was in the Blue Cross offices trying to clear up some charges that had been improperly rejected last January. The counter clerk told me my insurance had expired for non-payment some months ago. I hit the roof. Who wouldn't, in these days of high medical costs when one relies upon insurance?

I was told Blue Cross would not let me see a list of the payments received on my account. The reason, according to the supervisor, was that it was impossibly expensive to do this. The computers themselves could not hold the data, she said, and it involved searching microfilm records.

There was only one exception to the rule, she told me. If the IRS officially requested a person's account with Blue Cross be searched, then it would be done for the IRS. But never for the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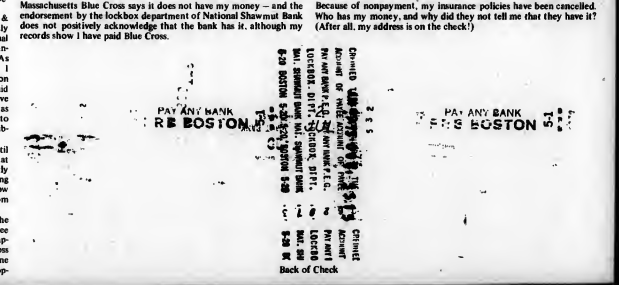
Massachusetts Blue Cross says it does not have my money – and the endorsement by the lockbox department of National Shawmut Bank does not positively acknowledge that the bank has it, although my records show I have paid Blue Cross.



Because of nonpayment, my insurance policies have been cancelled. Who has my money, and why did they not tell me that they have it? (After all, my address is on the check!)

Who Took My Cash? Was It Blue Cross or My Bank?

(Continued from Page 11)

subscriber.

This rule is unfair. The Blue Cross system uses a single turnaround card which is marked, "This Notice Must Be Returned With Your Payment," so the records kept by the individual subscriber are inadequate at best. To be told that statements were not possible because of expense put an already arrogant system into the position of judge and jury in its own case.

If what she was saying was true, then I did not believe that we were getting proper service from the systems analysts; if it was yet another of those excuses which would ultimately be blamed upon computer errors, then we were not getting proper service from her department.

She did say how a subscriber was expected to check matters for himself. He was supposed to keep all his checks, and be able to produce them for Blue Cross inspection. I do not think this is adequate, when you think of the spectrum of insurance operations and subscribers, but I personally went home and checked mine. I had the missing check, and it was then I began to realize the true complexity of the situation.

That was when I realized I was dealing with *two* inadequate operations, not just one. And while I was trying to straighten matters, I was over a barrel as far as my insurance was concerned.

The next day, when I took the check to Blue Cross determined to see the supervisor or someone higher, I was refused access to anyone. The supervisor would not be in for three days. No replacement was at her desk. No junior staff could talk about anything she was dealing with. No senior staff would even be asked to see me. My insurance was cancelled and remained cancelled – because that was what the computers said.

My basic problem was that while I had the cancelled check, it had not been personally receipted by Blue Cross. I could not tell whether Blue Cross had in fact received the money. I still don't know. They may have it – or National Shawmut may have it or have given it to someone else. I can't prove anything because of the weakness of the National Shawmut's method of handling lockbox accounts such as Blue Cross.

The idea of check endorsements is to prove clearly who has received the money. Normally endorsements are handwritten, or when handled in quantity they are rubber stamped. The endorsements given out to businesses by my local bank, for example, even include the account number.

But that is not the way the National Shawmut handles lockbox endorsements. To do that would cost them additional money – buying separate rubber stamps for each separate lockbox customer.

Instead, they prefer to use one standard stamp, "Credited to the account of payee," for all. This is not a receipt. It could have gone into almost any account and I would not know the difference. Any claim I might have against Blue Cross could be lost by the bank saying it had made a mistake, and offering me my premium back. A lot of good that would do to pay hospital bills!

As I went home, still with the check, and still uninsured, I called in on the local Kentucky Fried Chicken stand.

Here I watched what was later called "a programming error" – a family was overcharged 20 cents, their protests disregarded. The automated cash register rang up $6.69 for the Family Special. The price on the posters behind the register was $6.49.

But the assistant and the customer both accepted the programmed display over the advertised price. The Colonel ended up richer because of that "programming error."

Perhaps this is the real reason for the continuation of the poor level of systems design and implementation, shown here in relationship to two large, thoroughly organized, systems users.

Perhaps it is cheaper for them to carry on mistakes and errors, and apologize about them when forced to, but profit from them otherwise. I can see how Blue Cross can profit from mistakes, and now after watching the 20 cent overcharge stay in Colonel Sanders' pocket, I am getting quite disturbed about the possibilities of abuse through system inadequacy.

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Remember 1973?...

...When ACM's Code of Ethics Caused 'Black Decade'

By Donald J. Kenney
Special to Computerworld

ARMONK, N.Y., Oct. 17, 1983 – In late 1973 the Association for Computing Machinery officially adopted a code of professional ethics. Historians have now shown this code led directly to the market crash of 1975 and to the so-called "Black Decade" from which we are only now beginning to recover.

The code itself seemed innocuous enough. It required integrity, virtue, honesty, etc. from data processing professionals. It had no more real substance or authority than the ethical codes for the medical, legal or automobile repairing professions. Under normal conditions, it would have been both ineffectual and harmless. But, those were not normal times.

The ACM code was caught up in the wave of reaction which swept the country as evidence mounted of malfeasance and corruption both in politics and within the DP industry.

In the reaction, the ACM code was formulated into law – the worst, in retrospect, of the many laws (many good, a few bad) passed in that era. The first two states to include the ACM ethical code in its laws were Rhode Island and Minnesota. By May of 1974, 27 states had such a law, in the autumn of 1974, Congress added federal statutes to the list.

A Look Back?

The first known conviction under these laws was obtained in Montana on April 26, 1974. Frederick J. Abernathy, Mountain States sales representative for Synergenics, Inc. of Palo Alto, Calif., was convicted of knowingly and willfully misrepresenting a Synergenics 2796-4 disk as being "plug-to-plug" compatible with the CDC 6200 when in fact *only* the plugs (Amphenol Type 519-31 pin) were compatible. He got five years and $5,000.

Other arrests and convictions came thick and fast culminating in November 1974 when the entire sales staff of the IBM Federal Systems Division was arrested by federal agents for conspiracy to violate Public Law 892-54 – intention to knowingly misrepresent the capabilities of an information system.

Although the case – known popularly as the trial of the Gaithersburg 5692 – was eventually thrown out of the Federal District Court in Baltimore, Md., due to a flaw in the arrest warrant, the message was clear – lying about hardware or software capabilities could get one in big trouble.

A second message took much longer to become clear. That was that even without lying competition, telling the truth about hardware and software capabilities sold about the same number of computers and programs it always had – next to none.

Actually, few prospective clients actually needed a computer, and once salesmen were forced to describe their products honestly, the customers were able to figure that out.

Lost Contracts

Many companies which had bought into contracts discovered they would have to take a far larger loss than anticipated (glossing over defects was good for five to 10 years and a substantial fine) and had little or no prospect for recovering their loss.

An observant individual would have noted a suspicious number of vacancies at the presidential and vice-presidential levels of EDP firms in the fall and early winter of 1974-75.

As with most such things, the evidence of disaster accumulated slowly. A few astute individuals observed the direction of the wind, cashed in their chips and got out of data processing.

By early 1975, the unemployment percentages began to creep upward fueled by flocks of unemployed programmers and engineers as well as those who had been displaced in other fields by

(Continued on Page 12)

We've got an idea that ought to interest any OEM who's trying to bring down the price of his product.

Go buy yourself 5 Nova 2's with the new 16K memory boards. (Yes, we know you can probably get away with less memory. Bear with us.)

Now take a look at what you get: a high speed multi-accumulator 16 bit CPU, an I/O system with programmed data transfer, 16 levels of programmed priority interrupt, high speed Direct Memory Access, programmer's console, 4-slot mainframe, power supply and 16,384 words of 1 microsecond memory, expandable to 32K. With 4K and 8K memory modules also available.

That, you'll have to admit, is an awful lot of computer for the money. With twice the memory of other computers in that price range.

Hold on. It gets even better.

With that 16K memory, you won't have to talk down to the computer in machine language. You're going to be able to program in higher level languages.

So your programmers will be able to spend more time on what they want it to do and less on how to say it.

Which means they'll get the job done faster. And you'll get your product out on the market faster.

Both of you are going to save yourselves a lot of time and money.

Think about that for a minute.

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ACM Code Caused The 'Black Decade'

the few data processors who were fortunate enough to have talents, skills or family connections outside the EDP business.

Then the corporate reports began to come out showing evidence of disaster which even commonly accepted auditing practices could only partially mask. DP stocks slipped, slid, then, as the steady stream of bad news continued, crashed. IBM, at 419-1/2 in June of 1974, still stood at 411 on Jan. 1, 1975. On Jan. 15 it was at 388. On Feb. 1, at 358. On Feb. 15, at 306. On Feb. 19, it dropped 126 points from 297 to 171 before trading was halted. It reopened six days later at 194, gained five and promptly dropped 52 points. Other DP stocks did a great deal worse. IBM, after all, makes office equipment on the side.

Bankruptcies were widespread. Worse yet, prospects for DP firms were nonexistent.

Unfortunately, the DP industry had evolved to be far more extensive than most people had realized. Millions of Americans owed their living directly to computer-related jobs, and millions more were supported indirectly by EDP work.

The DP industry was every bit as much of a pillar of late 20th century society as was the automobile industry. When it collapsed, the society it supported collapsed. Despite the monetary shakedown of the early 1970s, the U.S. was still the leading economic force in the world. The stock market crash of 1975 led to a worldwide financial debacle including not only the capitalist world, but, to the surprise and chagrin of the communist world, the socialist and communist societies as well.

Once the nature and cause of the disaster became clear, attempts were made to recover. The ill-conceived ACM ethical code laws were, of course, repealed. But the magic was gone. Society was stuck on a skid into the depression of the later 1970s and the last thing anyone needed was an expensive computer, of dubious capability, to perform an unnecessary job. Humpty Dumpty was not about to be put together again.

We have now, most of us, survived the 1970s, and the economy appears to be on its way up. Our new society relegates computers to a minor and socially constructive role. Perhaps all this is to the good.

Yet one cannot but wish that the framers of the ACM code of professional ethics had been less concerned with ethics and honesty, and more conscious of their role as clowns and roustabouts in a circus – an entertainment which is, by its very nature, a deceit, albeit a harmless devisement, and a thing which should never, never have been taken seriously.

Who can sell computers in Japan?

In Japanese it's called **Shukan Computer.** In English, it means **"Computer Weekly".** Whatever you call it, it's an excellent vehicle for marketing EDP products and services to the second largest EDP market in the world (and the fastest growing).

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The latest census of general purpose systems revealed that there were 14,806 systems installed as of September, 1972, a 1-year gain of 3,569 units and $911 million in installed value. 1972 imports were over $360 million, so there is a lot of business being done by U.S. firms.

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  - tree structures
  - networks
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- ☐ Control key modification automatically adjusts database relationships.
- ☐ The system gives user control over the physical placement of records.
- ☐ The system provides versatility in ordering a set of records. For example, ordering may be:
  - ascending or descending
  - first in, first out
  - last in, last out
  - user determined.
- ☐ The user has an unlimited number of entry points into the database.
- ☐ The system dynamically allocates and deallocates data storage space.
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The Seminar

Attendance will be limited, to those who are really interested in Data Base Management, and by invitation. The date is Wednesday, October 31. The place is The Sheraton Hopkins Hotel, located at the Cleveland airport. The schedule includes:

October 30th	8:00 to 11:00 P.M.	Early arrivals hospitality suite.
October 31st	9:30 to 10:30 A.M.	CODASYL Data Base Task Group Specifications.
	10:30 to 10:45 A.M.	Coffee
	10:45 to 12:00	IDMS Technical Presentation, Part I
	1:00 to 2:00 P.M.	IDMS Technical Presentation, Part II
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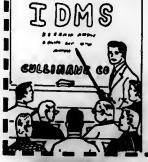

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Software Evaluation Strategy Aids User, Vendors

By Don Leavitt
Of the CW Staff

CHICAGO – The disillusioned user of leased or purchased software should ask himself if he used the same rigorous procedures in selecting packages as he used in establishing the design, programming and implementation of in-house systems, according to technical analyst Paul R. Weininger of Washington National Insurance Co. (WNIC).

Speaking to the recent ICP Buyers' Seminar, Weininger said his company has learned to see and treat outside software vendors as one alternative to an in-house development effort.

WNIC doesn't allow software salesmen to make unscheduled presentations of their wares, Weininger said, since that wastes time and effort. "That translates into dollars and ultimately increases the cost of the package," he explained.

Instead, the company has set up guidelines that make sure it has considered both in-house and outside resources.

Help!

Under these guidelines, everything starts with a request for help from a user department, and the success of the approach was attributed by Weininger to the total and continuing user department approval and support, and definition and costing out of all tasks to be performed.

After project initiation and definition, WNIC goes through a system survey comparing the proposed system to the existing one, if any.

If the project still has a "go-ahead," Weininger's group estimates costs in time, resources and money needed to develop the proposed system in-house. Not until that base is established does WNIC even let outside vendors know it might be in the market for software.

The company sends out to every conceivable vendor – large and small – a request for proposal (RFP). This provides the same system definition the company used to estimate in-house costs, and warns the vendor to respond, point by point, to those perceived needs, before "pitching" for any additional "bells-and-whistles."

The RFP also shuts the door on any presentation until WNIC has gone through its Software Evaluation Strategy, including the buildup of a "payoff matrix" to put all proposed systems on a standard comparable basis.

Values Assigned

Each element in the system WNIC has defined is given a weight or value based on its relative importance. This assignment of base factors considers separately user or application elements and those are important to the DP installation.

Each of the responses to the RFP is rated by Weininger's group, but selection of the "best" systems for the final selection process is not based on these figures alone.

WNIC tries to determine what additional cost overhead must be paid if modifications are needed to bring the proposed system up to all of the RFP's original specifications. Here again, the company tries to estimate the cost two ways, in-house or vendor-provided.

Finally, each proposed system that survives the early evaluation is benchmarked to show that it does in fact do what is claimed. And, after signing non-disclosure agreements, WNIC reviews at least parts of the actual source code and the documentation of the system.

After writing to current users of the proposed system and running financial checks on the vendors, WNIC then invites some to make in-house presentations. The benchmark, the documentation, user comments, the contract and final estimate of cost are all discussed during an all-day session.

With an approach such as this, Weininger concluded, WNIC is no longer faced with the threat of "buyer beware." Instead, the company has taken on a new maxim: "Buyer be aware."

NCR Updates Century Operating System

DAYTON, Ohio – Users at the upper end of the NCR Century series have begun to receive a new release of control software from NCR, including enhancements to the previously available B3 operating system, and a completely new B4 operating system.

The B3 operating system is roughly comparable to IBM's DOS in overall capability. It has the potential to support nine relatively fixed partitions, though NCR spokesmen admitted that average usage has been "about three."

To the old system, NCR has added job accounting, unit and file sharing between partitions for the disk subsystems, and a more modular structure to the operating system itself. The modularity will mean that users, especially the smaller ones, will be able to pick and choose the features they want and not waste space on coding to support features they don't use.

The B4 system includes the same enhancements but is more strongly geared towards operator interaction with the job stream. It has "very good conversational" facilities allowing the operator to get status reports and other control information with the CRT that is part of the 251 and 300 console.

A Stage III ANS Cobol compiler (upgrading but not replacing the Stage II processor) and a Fortran E load-and-go compiler are included in the B4 environment. Stage III supports a broader subset of full ANS Cobol and includes internal Sort capabilities, NCR noted.

Stage II will continue to be supported for both maintenance of reported problems and utilization of new peripherals as they become available. However, no major new modules of language enhancements will be added to Stage II, the company said.

The new Fortran E is described by NCR as a "mini-Watfour" and is designed to support educational users where speed of compilation is more important than execution speed. The new load-and-go compiler is an addition to and not a replacement for the previously available Fortran IV processor.

The new release of the operating systems is being distributed free by NCR.

The new version of Total being developed by Cincom Systems will be installed and supported by Cincom with assistance from NCR personnel. Pricing is expected to be comparable to IBM-oriented versions of Total, according to an agreement between the two vendors.

Optimizer II Eliminates Slow Cobol Object Code

PHOENIX – ANS Cobol programs compiled under OS/360-370 environments can be reduced – on average – 20% in size and 15% to 20% in execution time by including Capex Corp.'s Optimizer II as part of the compilation process.

The new product is similar to the original Capex Optimizer. Both are object-code optimizers in contrast to packages that review Cobol source code.

As with its predecessor, Optimizer II checks the overall flow of the user program. Wherever it finds code that redoes something that had already been done on the path leading to that code, it gets rid of the surplus code.

Because it works with user coding, Optimizer II has more variable results than the earlier Optimizer. It may be able to improve program size only 5% and run time not more than 10%, the spokesman admitted. On the other hand, he claimed, optimization saved 80% of the CPU time used by one program.

Optimizer II operates with IBM's ANS Cobol Versions 2, 3 or 4, and runs under OS/MFT, MVT, VS1 or VS2.

The package is available under rent plans ranging from $333/mo to $830/mo; leases from $265/mo to $750/mo; and one-time licenses from $8,000 to $20,000. A module of the original Optimizer to use with Cobol F programs is included on request at no extra cost.

Capex is at 2613 N. Third St., 85004.

Wang 2200 Puts Payroll On-Line

TEWKSBURY, Mass. – Wang Computer Services (formerly PHI Computer Services) now has separately priced modules to enhance the PHI Payroll II system. The basic package has been undisturbed, the company noted, and will continue to be supported.

"Perhaps the most important new feature," a spokesman said, is support for on-line collection of payroll data utilizing the Wang 2200 calculator as an intelligent terminal.

Other options include a personnel data base information capture and reporting system; support for complete employee history records; and a labor cost subsystem that goes beyond the simple capability that has been part of the regular package.

The Wang 2200 is programmed in Basic so there is no need to learn any new language, the Wang source noted. And the calculator can be used in stand-alone mode for work unrelated to payroll, alternately with the Payroll II support work.

The edited payroll data can be sent directly over communications lines to a central processor, or stored on optional cassette units.

The on-line linkup with the Payroll II application logic in the main CPU has been made possible, Wang said, through a rewrite of the Wylbur teleprocessing software. Currently supporting only the Wang 2200, the software can probably be adapted to use other intelligent terminals as well, the firm added.

While the Wang 2200 logic is programmed by the user, the other new modules are "generated" through parameter-card entries. None of the optional capabilities takes core requirements that are significant compared to the basic Payroll II system. The modules range in cost from $2,000 up.

Wang is at 836 North St., 01876.

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'DDS' Balances OS Work

NEW YORK – IBM 360/370 installations running under real or virtual OS and using the Dynamic Dispatching System (DDS), now available from Programming Methods (PM), can improve throughput of their batch processing partitions by reallocating priorities, on the fly, based on the current level of I/O interrupts within the partitions.

Without modifying either application programs or operating systems, DDS continually monitors I/O activity and allows those partitions with relatively high levels of I/O interrupt to assume higher priorities. Processing of CPU-bound jobs is handled during the interrupts of the I/O-dependent jobs.

Developed and already in use in Europe, DDS has allowed some installations to pick up as much as two hours per day in throughput improvement in "typically low priority batch processing" partitions, the company claimed, with little degradation of CPU-bound work.

The monitoring interval utilized by DDS to determine the current priority scheme is set by the user and some experimentation may be needed to find the optimum interval for any particular installation. The original priorities of specific partitions can be set to permanently override DDS. And that "lock" on assigned priority can apply whether the protected priority is high or low, a PM spokesman noted.

The basic system sells for $6,000 on a one-time basis, or leases for $300/mo for a minimum of 12 months.

Programming Methods, a division of GTE Information Systems, is at 1301 Avenue of the Americas, 10019.

Data Entry Package Adds Conditional Logic Tests

CUPERTINO, Calif. – Four-Phase Systems, Inc. has begun distribution of an enhanced Data IV/70, the key-to-disk software package provided with the company's intelligent terminal systems. The new version includes conditional data validation logic and expanded tape facilities.

The software supports communications with a remote IBM 360/370 concurrent with local key entry operations. Concurrent printing of data files, screen images and supervisory logs is now standard as well, the company said.

As with earlier editions of Data IV, Version 2 Release B is capable of handling up to 22 video terminals for use in keypunch replacement and source data entry applications. The addition of conditional logic, however, enables format programs to adapt themselves to conditions encountered during key entry operations.

IF Statements

IF tests can include an ELSE parameter so that users have considerable flexibility in directing the executing program to appropriate routines. The IF statement may be used with both single and nested expressions and these, a spokesman said, could reference previously entered fields, accumulator values, alphanumeric constants, value sets, or arithmetic and logical combinations of these.

The software also includes alpha string validation, logical AND and OR validation, format control of Automatic Skip/Duplicate and format references of system keywords such as Julian day and batch number. Variable length records within a batch, ordered output of batch sequences, supervisory display of operator status and return to keying position are also supported.

New mag tape facilities include tape search, checkpoint/restart, support for multivolume tapes and variable blocked records. A new level of control has also been added to simplify operator handling of more conventional source documents, a Four-Phase spokesman noted.

The new Data IV/70 is being supplied free to all System IV/40 and System IV/70 intelligent terminal system users, he added, from 10420 N. Tantau Ave., 95014.

Nine-Program System Controls Purchasing

WHITE PLAINS, N.Y. – Purchasing departments in a wide range of industries can improve their performance and profitability through a nine-program package from iBM. Used together, the programs are designed to help boost savings and give buyers more control over their responsibilities.

The programs focus on purchase order planning; quotation planning; requisition writing; purchase order release and maintenance; and purchase order status and review.

The purchase order program provides a choice of 12 predefined purchase order policies, or lets the user define his own for each product. The system can determine economic order policies and cash requirements, in the face of past-due open purchase orders.

The quotation planning elements of the package alert the buyer to missing or expired price quotations for items to be purchased in the future.

Requisition writing programs convert planned orders to open orders and prepare requisitions for those items designated by the buyer. Later the purchase order release and maintenance runs create a file to print orders, order alternatives and receiving packets.

The order status and review programs provide open order and exception as called for by the buyer. Orders that are closed or canceled are deleted from the active file. These programs and all others in the purchasing package provide user override to the "normal" action.

The entire purchasing package is written in PL/1 and operates on 360/370 systems, requiring a 64K main memory for DOS implementation and a 146K or 170K partition/region under the MFT/MVT OS options. They will execute under a VS environment.

Purchasing is available as a program product under license agreements for $300/mo (DOS) and $450/mo (OS).

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As Fight Turns to State Level

Only Users Can Stop Anti-Interconnection Forces

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – Users of customer-provided data equipment will suffer if a new effort to halt interconnection is successful. And the only way to stop this effort may be with a national users' organization.

The new attack on the use of non-carrier equipment will be waged on a state level and ostensibly will affect only intrastate services. But this is only a ploy of the common carriers and regulators – in fact all interconnection customers will be hurt.

The latest challenge to interconnection is essentially a replay of states' rights vs. federal authority. With the government having firmly advocated the use of non-carrier equipment through the well-known Carterfone and other FCC decisions, the common carriers have regrouped to fight another delaying action in the states.

And now instead of resisting integration, we find North Carolina resisting interconnection.

But why did this southern state, seemingly removed from the mainstream of communications action, propose to eliminate intrastate interconnection in November? It is doubtful that the concept originated entirely within the state's utility commission.

The world since Carterfone has been a frustrating one for the phone companies. After first being told they had to allow customer-provided equipment on their lines, they next learned they would have to compete with the specialized carriers for private-line users.

The established carriers soon found the FCC had little compassion for their cries about the dangers of competition.

Bell and most of the other carriers have always had things their own way. When two carriers provided similar services, they usually did so at rates which were very similar.

So Bell began to look for help by appealing to the state regulators. The state commissions had cause to listen. They felt by-passed by the FCC on vital issues that were changing previous restrictions on communications users, right in their own backyards.

One of the most powerful regulatory organizations is the National Association of Regulatory Utilities Commissions (Naruc). It succeeded in lobbying for a joint board which includes Naruc representatives.

This board has been empowered to review and make recommendations on major FCC proposals that will impact intrastate users.

But while the joint board was waiting for FCC advisory groups on interconnection to make recommendations, more and more users began to install non-carrier equipment.

And since the same facilities used for interstate communications services also are used for intrastate uses, the state regulators became concerned.

There is no mystery about why Bell is now taking its case to the state regulatory agencies. For it was Naruc that issued a court challenge to the famous specialized carrier decision. It asked to overturn the decision also in a state removed from most communications traffic, the state of Washington.

In addition to a proposed halt to intrastate interconnection in North Carolina, the Nebraska Attorney General has issued an opinion that vendors who provide and install equipment attached to the phone network should be regulated just like the phone companies. This would make non-carrier suppliers file tariffs for their equipment. A similar bill has been proposed in the Minnesota legislature.

Analysis

Communications users always find themselves at a disadvantage when it comes to regulatory issues. They have to be more concerned with running cost-effective networks.

It is true that regulatory proceedings are long, drawn-out affairs which are fought by high-priced legal experts. Most users have neither the time nor the money to become involved.

But the result of these proceedings does affect the user's pocketbook. The Carterfone case has made it possible to get a non-carrier modem and the specialized carrier decision has made it possible for private-line users to get non-Bell facilities.

And in both areas, innovative users are enjoying considerable savings.

What is needed is a national users' organization that has the power to speak out for its members. The problem is difficult because both interconnection firms and the specialized carriers serve data and voice users.

Some groups represent only the vendors, some speak out only for the voice telephone customer. And a few groups try to be all things to all people by speaking for both vendors and users.

There is virtually no group which can speak for the data communications user on both the national and state level.

The major user organizations, such as the International Communications Association (ICA) and Tele-Communications Association (TCA), are taking steps to change this. TCA members recently changed their by-laws so the organization can speak out on important issues with the approval of the membership.

But these groups are administrated by users who serve part-time to whatever extent their companies will tolerate.

A strong, full-time user organization would complement existing efforts. It is time data users take the necessary formative steps in this direction.

The important regulatory issues should not be hashed out between the carriers and the vendors. The data users must speak out to protect their interests.

Telenet Files for Value-Added Network

By Patrick Ward
Of the CW Staff

WASHINGTON, D.C. – Telenet Communications Corp. has filed an application with the FCC to establish and operate a "value-added" network based on the "packet switching" technology now being used in the Department of Defense's Arpanet.

Telenet Communications Inc. filed an application with the FCC to establish a similar type of network last January.

Telenet, a Bolt Beranek and Newman subsidiary, plans to use land-based and satellite communications channels leased from other carriers. The value-added carrier's customers will connect their computers and terminals to Telenet switching centers where minicomputers will divide the data into "packets" which are information pieces consisting of up to 1,000 bits. These will be dynamically routed along one of several paths.

Telenet officials said this routing technique will minimize end-to-end transmission delay, ensure accurate delivery, spread traffic evenly throughout a network and increase line utilization and system reliability.

The system would offer users effective interconnection between dissimilar computers and terminals by providing code, speed and format changes within the network. Automatic error-correcting techniques, also within the net, would reduce errors, the firm stated.

Usage charges to customers will be based on the volume of data, independent of distance. The proposed rate charge favors high-volume users, with rates ranging from $4 per 1,000 packets to $0.4¢ per 1,000 packets, depending on total monthly traffic for each subscriber computer. Nighttime usage prices will be halved.

Computer connection links to the Telenet central office will range from $500 to $4,500/mo for leased lines of from 4,800- to 50,000 bit/sec capacity.

Terminal connections will be priced on transmission speed, but customers may use either dial-in or dedicated lines. Dial-in usage will cost from $0.50- to $2/hour.

Telenet's charge for dedicated terminal connection will range from $50- to $200/mo, depending on transmission speed and not including the cost of the leased line, which Telenet stated it will provide to the customer at cost.

Telenet plans to initially build central offices with interface message processors (IMPs) and terminal interface processors (TIPs) in 18 cities with operation to begin within 18 to 21 months after an FCC permit.

Specialized Carriers Exchange Land-Based, Space Facilities

SAN DIEGO, Calif. – One of the subjects most on the minds of users attending the Annual Conference of the Tele-Communications Association was the emergence in the private-line area of the new specialized carriers.

Most of the specialized carriers were represented at the conference exhibition along with companies planning to offer domestic satellite services to users.

Southern Pacific Communications Co., one of the new carriers, and Western Union Telegraph Co. announced an agreement to exchange satellite and land microwave facilities to speed service to users.

SPCC will use facilities of the WU Westar satellite to expand its network to the East Coast while WU will utilize SPCC lines in the Southwest to provide service in Dallas, Houston, Austin and San Antonio. Westar is scheduled for launch in April 1974.

American Satellite Corp. announced an agreement with Western Tele-Communications Inc. to integrate certain facilities under a seven-year lease. Under the agreement, WTCI will lease "space and ground segment duplex circuits" from American Satellite.

In addition, American Satellite will acquire a California earth station site from WTCI, and Western will build ground facilities to American's offices in Los Angeles.

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Cool to Moratorium

'Why Halt Competition?': Users at TCA

By a CW Staff Writer

SAN DIEGO, Calif. – Users attending the recent Tele-Communications Association (TCA) conference heard an AT&T official suggest a moratorium on all competitive data transmission services now challenging Bell.

But most of the attendees surveyed were quick to object, and some questioned Bell's motives in trying to limit open competition.

Lucky Marr, corporate communications manager, Bechtel Corp., and vice-president of TCA, summed it up when he called the concept "terrible."

"We are now planning an advanced network using our own computer-controlled applications in key areas. We plan to use the equipment of a small non-carrier company, but AT&T is using its immense power in a direct frontal attack on the little user."

Bob Guaspari, director of communications, County of Ventura, Calif., wasn't concerned, but he has an ace up his sleeve: "We have our own microwave equipment, and we have a request in for an LEAA grant under which we would buy our own transmission equipment."

Ken Watts, manager of telecommunications, Fireman's Fund American Insurance Companies, on the other hand, was concerned: "It would cause problems as far as competitive pricing goes. Competition is definitely helping to get prices down.

"Everybody is reviewing their equipment costs and other manufacturers' modems have given us higher quality transmission at less cost plus the right to own equipment instead of leasing it."

Although Merle Breeden, superintendent of communications, Santa Fe Railway Co., also runs a private communications network, he termed the proposed moratorium "delaying tactics."

"I like to see competition and see these companies develop. What has been started, should be allowed to continue. We run data on our system and our non-carrier equipment has been the same quality as that supplied by Bell," Breeden said.

Jack Fetzer, Lockheed Aircraft Corp.'s manager of communications services, agreed and hoped that this move by Bell would not force communications users to be "stuck with the status quo for an indefinite period.

"It seems strange to call a halt before competition really gets off the ground. I just don't believe the specialized carriers will harm Bell that much," he added.

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Rule Change Permits TCA to Take Stands

SAN DIEGO, Calif. – The Tele-Communication Association may soon become involved in important issues confronting data and other users, according to the organization's incoming president.

A recent change in TCA by-laws will now allow the user group to take a position and represent the views of its membership, explained Stephan Ernst, chief analyst for communications and equipment research at The Bank of America.

As the new head of TCA, Ernst said he hopes the user organization will speak out on issues such as interconnection and the specialized common carriers, perhaps as early as the end of this year.

The change in its rules will allow TCA to issue a public statement when two-thirds of the membership at a special meeting approves such a move, Ernst said. One stipulation in this process calls for publication of the way members voted, "So that everybody's opinions are clearly indicated," he said.

'Universal Terminal' Uses Microprocessor

FOSTER CITY, Calif. – A "universal" interactive typewriter terminal from Gencom Systems, Inc. incorporates both an Intel MCS 4 microprocessor and a Diablo Hytype print mechanism.

The terminal is universal in the sense that while its standard code is Ascii, users can order an optional version that is switch-selectable to Ebcdic, Correspondence or Baudot codes. In addition, the terminal's programmable read-only memory (Prom) can be modified, at extra charge, to accept the user's particular control-codes.

Character to Plot

The terminal will switch from character mode to plot mode when the operator CPU issues a control F. The next control F would revert it to character mode.

Optional single or dual tape cassettes give the unit ASR capability. The terminal transmits at speeds of 100, 150 or 300 bit/sec. There is a 128-character buffer.

The terminal provides RS 232 and TTY interfaces as standard equipment, as well as a 10-key numeric pad.

First installations of the GSI 300 have been made. The terminal costs $3,950 or leases at $155/mo. with maintenance, from the company at 1181 Chess Drive, 94404.

A $13 Million 'Steel'

NEW YORK — The Securities Industry Automation Corp. (Siac) expects to reduce computer costs by $13 million over the next seven years by consolidation of equipment and locations and obtaining more favorable leasing contracts.

The computer arm of the New York and American Stock Exchanges forecasts savings of nearly $5 million from the decision to lease two IBM 360/50 computers for seven years from the U.S. Steel Leasing Co. The Model 50s will replace systems previously rented from IBM on a monthly basis.

Under IBM terms, Siac would have paid in excess of $10 million in rental charges over the next seven years; under the U.S. Steel Leasing agreement, the seven-year cost will be about $5.4 million.

Last fall, Siac signed a leasing agreement with Itel, Inc. for two IBM 370/155 computers. That agreement resulted in a $2.3-million savings (for the five-year term of the lease) over the rental cost from IBM.

In a further move to reduce costs, Siac has consolidated its seven computer centers into four, reducing the amount of peripheral equipment needed for efficient processing.

At the same time, Siac said it has obtained new, more favorable contracts for peripherals.

The consolidation and peripherals contracts will result in an additional savings of $5.9 million in seven years, the organization said.

A 'Porta-Verter' Venture

Remote I/O Comes Clean, Fast

By Michael Weinstein
Of the CW Staff

DAYTONA BEACH, Fla. — "We always felt paper tape was a poor method of preparing data at remote locations for processing at a central computer, but until recently we could find no other method," Chuck Hosbein, president of Daytona Data Center, said.

"Since we started to convert punching units to Iomec Porta-Verters, costs for data preparation have dropped, information is transmitted to the computer at least three times faster and we have experienced a 95% reduction in processing errors caused by incorrect input data," he said.

Porta-Verter is a device about the size of a typewriter. It can be used in a stand-alone mode as a standard calculating machine, or data can be entered through the standard numeric keyboard directly onto a cassette tape subsystem for future processing at a central host computer. It also incorporates its own communications facility allowing the user to attach a standard telephone hand-set into the back of the unit and send data directly to the host computer over telephone lines.

User Casebook

History of the Problem

Daytona Data Center started as an accounting firm. Until 1967 it had no computer, but used an independent service bureau for processing needs.

"When our bill with the service bureau reached $1,500/mo we felt we could save money by bringing a computing capability in-house," Hosbein said.

By 1968 the computer system was up and running and Hosbein branched out into the service-bureau business himself by offering accounting services to other accountants.

Basic hardware for his system included an IBM 360/20 with 12K bytes of memory, two 2311 disk subsystems with a total storage capacity of 54M bytes and a 350 line/min printer.

Heart of his business was the proprietary software that could take raw accounting information and produce balance sheets, profit and loss statements, general ledger and other accounting items.

The system grew to the point where it was servicing about 120 private accountants with no impact on the central system.

"The problems were with the information the accountants prepared and transmitted for processing," Hosbein stated.

For many years Feldon or Burroughs add-punch machines were used to produce the raw data on paper tapes.

The difficulty arose because data had to be punched in strict formats, using zeros to fill out unused columns. Errors were compounded because, "if the accountant did make a mistake, he could not tell from proofreading the holes in the finished tape," Hosbein said.

Three in One

With Porta-Verters in the accountants' offices, "they have three machines in one: a standard adding machine, a digital cassette tape recording system and an on-line terminal," Hosbein stated.

Now the accountants enter figures directly through the adding machine keyboard, and there is no need to zero fill or truncate.

"With the cassette tape the accountant can stop anytime, take his tape out and know when he comes back he will be able to start right in again. All he has to do is to command a search to last block, and the Porta-Verter's printing unit will print out the last record entered. Further editing functions allow the accountant to change records that are incorrect," he said.

Once a cassette tape is complete, the accountant inserts the phone hand set and transmits the data to the central computer for processing. "Our tests have shown that this method of transmission is four times faster than a standard teletype transmission," Hosbein added.

"Yet with this improved capability the Porta-Verters cost us $2,395 each compared with the older Burroughs and Friden units which cost around $2,700 when we bought them," he noted.

Calcomp Tape Units Lure Univac Users

ANAHEIM, Calif. — California Computer Products, Inc. (Calcomp) has unveiled a new series of magnetic tape transports designed to lure Univac 400 and 1100 computer users away from Univac's Uniservo 20, 16C, 12C, VIIIC and VIC tape units.

The plug-compatible 8820 Magnetic Tape System is composed of the 8820 tape controller and from one to 16 300 Series tape units in any combination of models 316 and 320.

The 8820 connects to the word-parallel interface of the Univac central processor to control tape units with 9-track single- and dual-density and 7-track features.

With the single-density feature, operating mode is 1,600 bit/in. phase-encoded. With the addition of the dual-density and 7-track feature, the 8820 can accommodate 9-track 1,600 bit/in. phase-encoded or 800 bit/in. NRZI, as well as 7-track 556/800 bit/in. NRZI tapes.

All data transfers are in the burst mode with the 8820 executing one command on one tape unit at a time, a spokesman said.

The controller checks parity on each byte. On write operations, parity errors are detected and corrected before the byte is sent to the tape unit. On read operations, parity errors are corrected before the byte is sent to the selector channel.

In addition to error detection and single-track error correction, a phase-encoding error correction is included.

A switchboard-like tape unit interface on the controller permits individual tape units to be switched out or physically removed without affecting operation, a spokesman said.

300 Series Tape Units

Both the Model 316 — operating at 125 in./sec — and the Model 320 — at 200 in./sec — are plug-compatible with all models of the Univac 1100 and 400 series.

Features available on the tape units include:

- Feature 8401: single-density 1,600 bit/in. phase-encoded 9-track operation.
- Feature 8402: dual density 1,600 bit/in. phase-encoded and 800 bit/in. NRZI 9-track operation.
- Feature 8403: 7-track 200, 556, 800 bit/in. NRZI 7-track operation.
- Feature 8404: dual access and simultaneous read/write operations on any two tape units.

Purchase price for a typical system consisting of controller and six Model 316 single-density 1,600 bit/in. drives is $125,700 plus maintenance. Leasing arrangements are also available.

Calcomp is located at 2411 West La Palma Ave., 92801.

Varian 620s Gain Direct-Access Tapes

BELTSVILLE, Md. — Linc tape direct access mass memory has been announced for the Varian 620 minicomputer.

Linc tape is essentially a "disk on tape," according to the developer, Computer Operations, Inc., in that "it appears to the CPU as a disk providing the capability to overwrite in place on directly addressable blocks without disturbing adjacent data."

Transfer rate is 8.4 kbyte/sec with reels containing either 205K or 336K bytes of data in blocks of 512 bytes.

Operating software includes a text editor, DAS assembler, file management programs and loaders.

Cost for the Model CO-500VP is $3,950 and includes a program-controlled master Linc Tape system for the Varian 620 and 73.

The Model CO-500VA consists of a direct memory access master Linc Tape system for the 620 and 73 series minicomputers. It uses only one I/O slot and costs $4,950.

Computer Operations is located at 10774 Tucker St., 20705.

Printer/Plotter Brochure Available

CUPERTINO, Calif. — Users thinking of acquiring matrix electrostatic printers and/or plotters can obtain a technical bulletin from Versatec, Inc. describing the interfacing of these units to various computers.

The bulletin describes the basic interface in detail and includes pin connection lists and timing diagrams. Also discussed are print, plot and simultaneous print/plot operations.

Copies of the bulletin can be obtained from the firm at 10100 Bubb Road, 95014.

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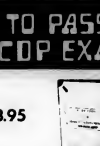

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Machine And Handprint Recognized

Optical Data Entry System 'Replaces 12 Keypunches'

By Michael Weinstein
Of the CW Staff

PALO ALTO, Calif. – Replace 12 keypunches and their operators with one Optical Character Recognition (OCR) unit is the message behind the release of Data Recognition's new ADES-1.

The ADES-1 is designed to convert numeric data from hand-written documents to computer compatible input of magnetic tape, floppy disk or Micr impressions in one pass.

This one pass capability contrasts with some operations where computer input is prepared three times – by the personnel entering source data on a form, at computer input station by operators . . . and by operators verifying the input.

The ADES-1 converts data from source documents at a rate of 40 char./sec for handwritten numerics up to 250 char./sec for standard printed type fonts; seven fonts are available.

Logic and systems control is provided by a resident program prepared for each user's application prior to shipment.

These user specified programs read specified fonts; select pertinent data fields; and control various I/O functions.

Internal memory capacity for operation control and single font capability is 16K bytes, but is expandable to 64K bytes. About 4K bytes additional memory is required for each added font capability.

Users can expand output stackers from the basic four to a maximum of 32 in modules of four.

Each output stacker is accompanied by a 12 column stacker printer to list data, indicate number of documents containing scannable, as well as unscannable data, and batch totals under program control.

The ADES-1 is available in reading capacities from one to six lines with maximum reading line length at 8-1/4 in. Documents containing mixed, hand-written and machine fonts are readable on one pass.

A nine-channel 800 bit/in. tape drive is standard with a 1,600 bit/in. unit also available.

For banking operations, a Micr encoder encodes data back onto processed checks.

Users can obtain on-line storage capability by use of the optional 3M bit floppy disk drive.

The floppy disk is capable of recording all data read by the scanner. Second entry is made by interrogating the diskette subsystem through a video display unit.

In this manner, the diskette subsystem can be used for applications with a significant volume of unrecognizable input and variable input not contained on source documents, the spokesman said.

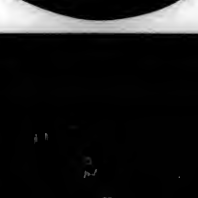
A 20 column master impact printer can be added to provide hard copy of all data converted to computer input media.

Price of the system depends on each user's specific requirements, the spokesman said, but prices range between $72,500 to $170,000. Typical systems cost between $85,000 and $105,000.

Data Recognition is located at 908 Industrial Ave., 94303.

Now you can have key-to-disk and RJE going in one system.

Concurrently.



System 2400 invites you to forget scheduling hassles.

You can have an RJE terminal available full time. You can access about any major mainframe you wish, and do it at speeds as fast as your communication lines can move the bytes.

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Consider, too, the other System 2400 options for your RJE site. On- or off-line printing, editing, media conversion, your own programming. They're all available today or as you need them with a minimum of added hardware and a growing library of software.

System 2400 goes together your way, so you master today's needs and are more than ready for tomorrow's.

Call us, and we'll put it all in terms of your requirements. That's how MDS has grown to have a user list second only to IBM. Phone your local MDS representative or call headquarters at (315) 792-2424. Mohawk Data Sciences Corp., Utica, N.Y. 13503.

HP Offers Better Floating Point

PALO ALTO, Calif. – Hewlett-Packard 2100 users can obtain a microprogrammed floating-point capability through a read-only memory (ROM) that plugs directly into the user-accessible microprocessor of the computer.

The new floating-point microprogrammed capability is five to 20 times faster than if floating-point operations were handled from core memory, and it costs 80% less than the previously available floating point for the 2100, HP said.

The floating point microcode is held in a 256-word read-only memory. This microcode gives users the ability to add, subtract, multiply and divide numbers in scientific notation and to convert from fixed to floating point and vice versa.

Internal speed of the microprocessor is 196 nsec compared with memory cycle time for main core memory of 980 nsec.

Thus, the microprocessor can perform five microcoded instructions in the same time period it takes main core memory to perform one operation.

In one 196-nsec time period the contents of two different registers could be put through the arithmetic unit and the sum written into a third register.

The move to ROM has allowed HP to reduce the cost for floating point to $500.

The firm is at 1501 Page Mill Road, 94304.

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Asis '73 Schedules 3 Debates

LOS ANGELES – Should the American Society for Information Science (Asis) go on record as advocating the certification of information scientists and prepare a program to achieve certification in 1976?

The answer to this question may result from a formal debate scheduled during the 36th Annual Asis meeting, Oct. 21-25 at the Hilton Hotel here.

Societies/ User Groups

Two other debates are slated for the conference. The first, dealing with the question of copyrights, will be aimed at deciding whether it should be considered infringement for research purposes to make copies of all or parts of publications resulting from work supported partly or entirely by government-funding mechanisms.

The final debate will focus on "Resolved: That Asis should take a leadership role in developing and establishing standards required by the information science community."

Technical sessions will include discussions of network interconnection; micrographics – their place, use and future; and the National Commission on Libraries and Information Science (NCLIS).

In addition to the sessions, Asis special interest groups will host technical sessions on subjects ranging from the state of the art of reprographic technology to the structure of economic and cost analyses.

On Thursday, the politics of information will be discussed.

Registration for the "Information Benefits &./Costs" conference is $45 for Asis members, $60 for others. Further information is available from H.W. Jones, Asis '73 Conference Chairman, Northrop Corp., Aircraft Division, Hawthorne, Calif. 90250.

Registration Closes Early for Datacomm

ST. PETERSBURG BEACH, Fla. – Due to the heavy advance interest, registration for the Third Data Communications Symposium – Datacomm'73 – will close Nov. 2, according to officials.

The symposium, sponsored by IEEE/CS and ACM/Sigcomm, will feature six non-parallel sessions: Performance of Computer Communication Systems; Issues in Data Network Design; Network Control – Signaling, Multiplexing and Message Handling; The Network Interface – Packet Switching; Teleprocessing Network Analysis and Design; and Reliability of Networks.

A pre-symposium tutorial on data networks will be held Nov. 12 to provide an overview and a survey of the technical aspects of data networks. Topics will include routing and flow control, network design algorithms, and multiplexers, concentrators and network optimization.

Further information on Datacomm'73, which will be held Nov. 13-15 at the Happy Dolphin Inn here, is available from Third Data Communications Symposium, P.O. Box 639, Silver Spring, Md. 20901.

Conference Examines Pattern Recognition

WASHINGTON, D.C. – The First International Joint Conference on Pattern Recognition is intended to bring together scientists and engineers to report their latest research and developments and to discuss the directions and goals for future work in pattern recognition, according to conference treasurer Tou Rotolo.

The conference, Oct. 30-Nov. 1 at the Mayflower Hotel here, will feature 65 papers covering character recognition, syntactic methods, adaptive pattern recognition and picture processing.

Mathematical methods, biomedical application and remote sensing will also be covered.

Among the papers to be presented are "Class: Non-Parametric Clustering of Large Data Problems," "Machine Recognition of Handprinted Characters," "Pattern Recognition of X-Ray Images" and "Some Studies on Parallel Processing for Character Recognition."

Workshops, Too

In addition to the paper presentations, there will be two workshops – "Bridging the Gap Between Theory and Implementation in Pattern Recognition Research" and "Problems in Pattern Recognition Research."

Registration for the conference is $55 for sponsor members (ACM, IEEE, Hips, OSA, PRS, SPIE) and $65 for non-members and $10 for students.

Further information is available from Louis S. Rotolo, Pattern Recognition Society, P.O. Box 629, Silver Spring, Md. 20901.

Calendar

Oct. 12-13, Sacramento, Calif. – Data Processing Legal Seminar and Workshop. Contact: Sacramento Chapter, DPMA, P.O. Box 1223, 95806.

Oct. 23-25, New York – IEEE Seminar. "Effective Engineering Design." Contact: Educational Registrar, IEEE, 345 E. 47th St., 10017.

Oct. 24, Saddle Brook, N.J. – Third Jersey Systems Conference of the ASM. Contact: Dennis J. Jones, Merck & Co., Bldg. 60-42, Rahway, N.J. 07065.

Oct. 24, New York – ASM Seminar. "The Human Side of Systems." Contact: ASM Education Dept., 24587 Bagley Road, Cleveland, Ohio 44138.

Oct. 24-26, Denver – Honeywell Health Care Users Group. Contact: Thomas Alex, St. Joseph's Hospital, 220 York Road, Baltimore, Md. 21204.

Oct. 25-26, Detroit – DPMA Region Nine Fall Conference, "The 70's and Beyond." Contact: Glenn Fritach, Automobile Club of Michigan, 150 Bagley Road, Mich. 48226.

Oct. 26, New York – Eighth Annual ACM Urban Symposium. Contact: Etelie Grinoch, Sperry Gyroscope Co., Great Neck, N.Y. 10020.

Oct. 28-30, Atlanta – Digitronics Users Association 8th Annual Conference. Contact: Glenn Lutat, DUA, P.O. Box 497, Santa Clara, Calif. 95052.

Oct. 31, St. Louis – National Conference on the Use of On-Line Computers in Psychology. Contact: Dr. Donald Tepas, Dept. of Psychology, St. Louis University, St. Louis, Mo. 63103.

Nov. 4-6, Gaithersburg, Md. – ACM Sigplan/Sigir Interface. Contact: Registration Chairman, P.O. Box 212, Silver Spring, Md. 20907.

Nov. 5-7, Atlanta – Cooperative Health-Care Users Group (Chug). Contact: Robert Murrie, Florida Software Services, P.O. Box 2269, Orlando, Fla. 32802.

Nov. 5-7, Boston – IEEE 1973 Conference on Systems, Man & Cybernetics. Contact: Sheldon Baron, Bolt Beranek & Newman, Inc., 50 Moulton St., Cambridge, Mass. 02138.

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COMPUTER INDUSTRY

CI Notes

NCR Buys Adds Terminals

HAUPPAUGE, N.Y. – NCR has agreed to market Applied Digital Data Systems Inc.'s (Adds) CRT terminals.

The three-year contract is valued at over $10 million. During the first year Adds will receive more than $2.5 million, according to the firm. Deliveries will start in January.

Trade Secret Trial Date Set

CW West Coast Bureau

SAN JOSE, Calif. – Pretrial motions in the multimillion dollar industrial espionage case involving alleged theft of trade secrets from IBM have been set for Nov. 26.

The San Jose Superior Court judge said it would take at least a week to hear all motions from the ten defendants, who allegedly conspired to steal secrets relating to three generations of IBM disk drives.

The defendants are expected to ask for discharge of the indictments, change of venue and severance of the cases.

ITT Picks Data Products Core

WOODLAND HILLS, Calif. – Data Products Corp. has received a multimillion dollar contract for core memory systems from the Bell Telephone Manufacturing Co. of Belgium, an ITT subsidiary.

The memories will be made in Ireland at Data Products Core Memories, Ltd., a subsidiary of Data Products.

HIS Markets Hospital System

WALTHAM, Mass. – Honeywell has been named worldwide licensee of a computerized hospital management system designed by National Data Communications.

Honeywell will market the system and NDC will provide maintenance and facilities management services.

Supershorts

Tesdata Systems Corp. is centralizing its engineering and manufacturing operations in a subsidiary, California-Tesdata, Sunnyvale, Calif.

– – –

Conrac Corp. has named Elektron, Gmbtl, as its sales representative in Western and Eastern Europe for its CRT terminals, models 480 and 481-3.

– – –

Honeywell has selected Information Systems Iran as distributor for its DP products and services in Iran.

– – –

Sorbus Inc. is offering documentation services to DP equipment manufacturers for the preparation of technical manuals, handbooks and trouble-shooting procedures.

Claims Agencies Buy Without Bids

CLA Hits Federal Procurement Practices

By Molly Upton
Of the CW Staff

WASHINGTON, D.C. – The Computer Lessors Association (CLA) has taken the General Services Administration to task in a series of letters decrying the practice by federal agencies of transferring rented DP equipment within agencies without reopening bids for the systems.

In addition, the "GSA has and continues to buy previously rented equipment from IBM on a sole-source basis," executive director James F. Benton stated.

Benton reiterated the charge that the use of mandatory memory contracts [CW, Aug. 8] "stifles our industry's ability to offer cost reductions on government-acquired [DP equipment]." He also charged the GSA with issuing "restrictive hardware requirements.

"Many departments and agencies are using the rental accruals and special purchase options to buy an installed item or items of [DP equipment] from the OEM without a competitive solicitation which circumvent the intent and spirit of your procurement regulations are just not being adhered to or enforced," the CLA chief said.

In fiscal 1973, Benton said, over $40 million [worth of equipment] (overwhelmingly IBM) [was] transferred between agencies when no least-cost alternatives were sought."

In a reply letter, Commissioner M.S. Mecker of the GSA's Automated Data and Telecommunications Service defended the mandatory memory contracts and cited the use of competitive bidding for DP equipment by agencies.

He admitted the GSA "is not empowered or staffed to audit the activities of agencies to determine whether they comply in each and every instance with existing regulations; however, when such actions are specifically identified and brought to our attention, we take appropriate action to preclude their recurrence."

The GSA, Meeker said, issued "letters to all agencies advising them that they should consider several courses of action which include the availability of equipment from leasing firms. This type of guidance was issued so as to preclude occurrences such as those you allege to have happened."

Since initiation of the "Master Terms and Conditions," jointly developed by the CLA and GSA, Meeker stated, the GSA has acquired "23 systems and awarded contracts valued at about $4.4 million. These contracts have gone almost exclusively to the third-party industry," he noted.

On the subject of the memory contracts, Meeker said, "It is our obligation to the general public to acquire equipment which meets the government's needs at the lowest overall cost. Our chief concern in this area is that all potential suppliers have an adequate and equal opportunity to compete.... We have reviewed the extent of competition received on solicitations where memory was to be obtained from the mandatory requirement contract and solicitations where memory was to be obtained from the general marketplace along with the CPU. Our records show the number of offers received under each type of solicitation is virtually the same."

In a return letter to Meeker, Benton said the CLA believes, "It is incumbent upon GSA to be aware of DP systems which are procured on a sole-source basis and stop the practice. If, as you state in your letter, GSA 'is not empowered or staffed to audit' these activities, then who can we turn to for help?"

GSA Initiates Quality Control After Trouble With Memories

WASHINGTON, D.C. – The General Services Administration is initiating a quality control program on requirements type contracts to insure that DP products perform to specifications, according to a GSA spokesman.

Several agencies procuring add-on memories under mandatory contracts encountered difficulties with the equipment.

The GSA is forming interagency committees, comprised of principal technical users, to work with the GSA in qualifying the devices, and is also inserting a quality assurance program in the contractual terms, the spokesman said.

The GSA has always had, but not always used, the right to conduct a performance test prior to award, he said.

Under the new plan, the interagency committee would "observe and accept or reject the preaward performance," he said,

"There were initial performance problems with memories for the 360/65 and other models; however, as far as we are aware, there are no performance problems now," he said.

Certain Units Required

Under the mandatory type of contract, government agencies are required to procure memory for new machines from specified firms or replace existing memory if the installed memory costs more than the bids from these firms.

Under the contracts, Cambridge Memories supplies units for 360/30s, Ampex for 40s, 50s, 65s, 370/165s, and Univac 1106s and 1108s, while Memory Technology supplies memory for 370/155s.

The firms' bids ranged from 60% to 80% off the original mainframe prices for equivalent types of memory.

There were problems on the Ampex units for the Univac 1106 and 1108 and the 360/65 and 370/165. There were no problems with Ampex units for the 40 and 50, the spokesman said.

On the 1108, there were "several" problems, some pertaining to parity checking, and a cabling problem, he noted.

There were about three sites that experienced problems on the 65 and 165 memories, and they appeared to vary by site, he said.

Memory Technology experienced "what appeared to be a design problem" on the first 370/155 site. "They got that straightened out and there hasn't been any problem since," he said.

There were no reported problems on the Cambridge Memories 360/30 units.

Minis Seen Bringing Changes

LOS ANGELES – The accelerated development of minicomputer systems in business is giving rise to new opportunities and new dangers for suppliers, and a new approach to management of computers by users, according to Frank Wagner, executive vice-president of Informatics, Inc.

The chief impact of the use of minicomputers in business for a wide range of tasks will be "to bring computer management back to the people who do the work," he told the Western Systems Conference of the Association for Systems Management.

Where minicomputer systems are concerned, Wagner warned, it may be dangerous to follow Mindy Grossch's First Law (which can be formulated as "throughput capacity of the computer increases as the square of the price").

He offered "Wagner's First Principle of Decentralized Computing" as a guide for users: "If an organization group smaller than 30 people required computer assistance, it is better for the enterprise that these people have exclusive use of their own computer, provided that the computer, big enough to do the job properly, will be loaded to over 10% capacity."

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IBM Agrees With U.N. on Need For Multinational Conduct Code

By Toni Wiseman
Of the CW Staff

NEW YORK – While agreeing with the United Nations Economic and Social Council's recommendation for a "set of institutions and devices" to guide the exercise of power of multinational corporations, IBM cautioned that such institutions "might actually upset the special conditions an industry such as ours needs if it is to continue to play its key role in development."

Jacques C. Maisonrouge, president of IBM World Trade, was referring to institutions and devices advocated in a U.N. report, to "guide the multinational corporations' exercise of power and introduce some form of accountability to the international community in their activities."

Guidelines which would lead to reduced remittances, requirements for the dispersal of manufacturing and R&D capabilities, and the demand for divided ownership or local control "would cripple the effectiveness of many high technology companies, most certainly including IBM," said Maisonrouge, addressing a group at the U.N.

Maisonrouge advocated the establishment of a code of conduct, or multinational company register. While recognizing the difficulty of drafting a code that would be acceptable to all, he urged the inclusion of five points:

- "The employment of nationals totally or predominantly, in affiliates should be strongly encouraged.
- "There should be multinational representation in headquarters and on boards of directors.
- "Stock ownership should be on a multinational basis.
- "There should be adequate guidelines on transfer pricing.
- "The performance of a company, particularly in a developing country, should be judged to a degree on its performance in the area of social responsibility."

In his address, Maisonrouge pointed out that "virtually all IBM employees abroad are nationals of the countries in which they work. Out of our nearly 117,000 IBM employees outside the U.S., less than 28,000 are employed in manufacturing."

IBM is in "three different but deeply interrelated businesses within the computer industry – we produce software, hardware and provide services. These activities require the allocation of our resources on a worldwide basis," he noted.

"As you know, there is a school of thought that sees the multinational company and the nation-state on a collision course," Maisonrouge said. "We do not believe this is so. The two, in our judgment, will work out the differences between them."

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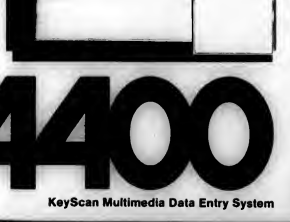

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1. There's no such thing as a 32-bit minicomputer.

2. Minicomputers have an absolute 64K addressing limit.

3. The only way to even access more is to resort to some sort of hardware kluge with a hairy software scheme that'll cost you an arm and a leg.

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Performance	7/32	Nova 840	PDP-11/40
Word length	32	16	16
Memory speed (nanoseconds)	750	800	900
Maximum memory capacity (bytes)	1,048,576	262,144	262,144
Addressing range (bytes)			
Direct	1,048,576	512	65,536
Relative	±16,384	±256	±32,768
Indexed	1,048,576	65,536	65,536
Double indexed	1,048,576	No	No
General-purpose registers	32 32-bit	4 16-bit	8 16-bit
Index registers	30 32-bit	2 16-bit	8 16-bit
Vectored interrupt levels	Yes	No	Yes
Minimum interrupt overhead time (usec)	6.5	47.5	46.5

Price	7/32	Nova 840	PDP-11/40
32 KB processor	$ 9,950	$12,930	$15,345
64 KB processor	14,450	19,330	26,925
128 KB processor	23,450	35,630	46,725
256 KB processor	41,450	61,230	80,825
1 Megabyte processor	171,650	Not available	Not available

Source: Data General Price List, 5/15/73. DEC PDP-11/40 Price List, 6/73. DEC OEM & Product Services Catalog, 1972. Auerbach Minicomputer Characteristic Digest, June, 1973. "How to use Nova Computers", 1973.

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Software Bill Has Industry OK

By Toni Wiseman
Of the CW Staff

NEWTON, Mass. – Industry reaction was unanimously favorable to the recently passed California software taxation bill, according to a *Computerworld* survey.

The bill, AB69, recently signed by Governor Ronald Reagan, exempts from taxation all software except that classified as "basic operational."

The software which remains taxable under the present bill includes the common fundamental control programs whose price is generally included in the vendor's hardware price.

"The basic operating system is always claimed by the vendor to be a piece of the hardware, so to speak, so it's probably fair to tax that," said Dick Jones, president of Programmatics Inc. "But certainly the applications that the user builds are not really things that can be assessed properly by the tax people, since different users use different ways for accruing their costs and placing a value on these programs."

"I'm pleased as punch," said Bill Newcomber, vice-president of Dylakor Corp., about the law. "I think it will be a tremendous benefit to the software industry in California.

"What they were proposing was an extremely dangerous thing," he said, "because it was like taxing something which doesn't really exist, like an idea.

"If they'd been allowed to do that, they would be able to go in and tax lawyers' briefs and contracts and everything else."

"I think the only reason they're taxing basic operating systems is that this way they can tax the entire price when a customer buys an IBM computer," said Marty Goetz, vice-president of Applied Data Research. "I don't think it's going to effect any independent software company's policies."

Dave Ferguson, president of System/3, did not agree with this view. "I think that vendors may tend to write their programs differently," he said, "essentially to put less in or to circumvent the law by either making the operating software negligible or making it so big that it performs so many additional functions that it can't be construed as being operating system type functions. From the legal point of view the operating software itself might not exist."

Apart from benefiting software users in California, the amended bill is expected to aid in the passage of similar laws being considered in other states.

The only question which seems to arise is the definition of "basic operational software" as set forth in the bill.

"Software is a delicate, difficult subject, you can't really nail it down in an assembly bill," Ferguson said.

"The definition is still a little bit of a problem, it's sort of subject to interpretation," Newcomber agreed, "but I think there was enough wordage in this one so they're going to have a harder time trying to tax everything."

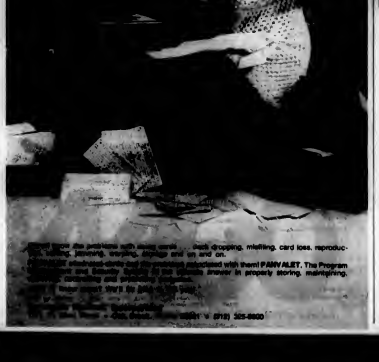
Orange County Awards CSC $26 Million Contract

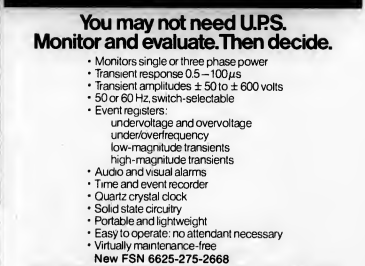
CW West Coast Bureau

SANTA ANA, Calif. – Orange County has finalized its $26 million facilities management agreement with Computer Sciences Corp. (CSC).

The contract was signed by Ronald Caspers, chairman of the board of supervisors, and Erwin L. Allen, president of CSC's commercial division. The signing took place after receipt of a $1 million letter of credit from the Bank of America in lieu of a performance bond.

The county will also withhold 10% of each invoice until it builds a $1 million account as a performance guarantee.





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INTERDATA ANNOUNCES THE INDUSTRY'S FIRST $3200 MINICOMPUTER TO CHALLENGE THE NOVA.

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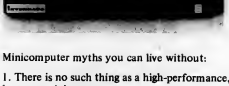

Minicomputer myths you can live without:

1. There is no such thing as a high-performance, low-cost minicomputer.

2. You have to choose between two extremes – pay a ton for a machine like the PDP-11 and save on software costs, or buy a cheapie like the Nova 2 and pay the price later.

All wrong.

Because now there's the Interdata 7/16 – an extremely flexible 16-bit OEM minicomputer that combines the best of both worlds.

It's easier to program than the PDP-11 because it has 16 hardware registers, up to 64K bytes of directly addressable main memory, 255 I/O interrupts with automatic vectoring to service routines and a comprehensive set of more than 100 instructions. That's a lot of muscle.

It's completely modular in design – plug-in options can be installed in the field to meet your specific application requirements.

Performance	7/16	Nova 2/4	PDP-11/05
Data word length (bits)	4, 8, 16	16	1, 8, 16
Instruction word length (bits)	16, 32	16	16, 32, 48
General-purpose registers	16	4	8
Hardware index registers	15	2	8
Maximum memory available (K-bytes)	64	64	64
Directly addressable memory (K-bytes)	64	2	64
Automatic interrupt vectoring	Standard	Not available	Standard
Parity	Optional	Not available	Special order
Cycle time (usec.)	1.0 or 0.75	1.0 or 0.8	0.9
Available I/O slots	4	2	2

Price	7/16	Nova 2/4	PDP-11/05
8 KB processor 16 KB processor 32 KB processor	$3,200 3,700 5,300	$3,200 3,700 5,300	$4,795 6,495 10,895
Multiply/Divide option	$950	$1,600	$1,800
Floating Point option	$4,900	$4,000 plus $1,200 for 2/10 configuration	Not available

Source: Data General Price List, Copyright 1973, and addendum dated 5/15/73. Nova 2/4 bulletin 015-000060, 1973. DEC OEM & Product Services Catalog, 1972. Averbach Minicomputer Characteristic Digest, June, 1973. "How to use Nova Computers", 1972.

Options like multiply/divide, programmers' console with hexidecimal display, power fail/auto restart, memory protect and a high-speed Arithmetic Logic Unit that includes floating point hardware. In fact, you can expand the low-cost 7/16 all the way up to the 32-bit Interdata 7/32.

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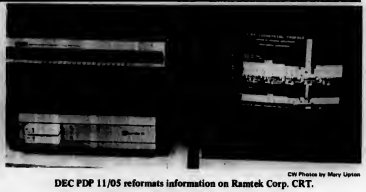
Hidden in Cabinets...

HP 2115A, with Diablo disk, drives CPS, Inc. color graphics system.

Data General Nova 1210 works with Hughes Aircraft Co. graphics system.



DEC PDP 11/05 reformats information on Ramtek Corp. CRT.

CW Photos by Mary Upton

...Minis Play Supporting Role at Show

By Molly Upton
Of the CW Staff

SAN FRANCISCO – Minis, once the star of trade shows, have lately found an important, though less conspicuous, role in supporting other devices. At a recent trade show here, Wescon, the minis were in abundance, but primarily as components.

Hidden in cabinets, sitting on the floor or somewhere within a unit, minis were at work driving display units and testing devices.

CPS, Inc. of Sunnyvale, Calif., used a Hewlett-Packard 2115A to drive its four-color graphics system.

Ramtek Corp., also of Sunnyvale, chose a Digital Equipment PDP 11/05, linked with a Cartrifile 2D tape unit to reformat information shown on its Conrac tube.

Hughes Aircraft Co., Industrial Products Division, hid a Data General Nova 1210 in a cabinet and used it as a data source to drive the Conographic display terminal system.

Data Disc, Inc. used an Interdata 70 with a Bright tape drive in its Anagraph display system.

A DEC PDP-8/e drove a Gould Inc. Brush 6000 video and data logger monitor. The unit can handle up to 128 channels and displays numerical data on a CRT.

In the Xynetics booth, an HP 2100A with a 7970B tape drive drove a Xynetics C62 controller for its 1050 plotter.

Although not known specifically for its minis, Teradyne had its own 16K mini as part of its N151 automatic backplane test system.

Tektronix used DEC PDP 11/05s to drive its 7704A oscilloscope and its digitizer.

Although the Hewlett-Packard Data Systems Division did not exhibit, an HP 2100S was at work in the firm's automatic digital circuit test system.

DEC had a PDP 16/m linked to its RTO2 alphanumeric data entry terminal.

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DEC PDP-8/e, perched on the floor, drives Gould Brush 6000 data logger.

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Allen-Babcock Suit Cites Tymshare 'Stratagems'

By Marvin Smalheiser
CW West Coast Bureau

LOS ANGELES – Intrigue and subterfuge are alleged by Allen-Babcock Computing Co. in its $45 million breach of contract suit against Tymshare, Inc. following the termination by Tymshare of their merger agreement.

Tymshare described the Superior Court suit as without merit and said it will vigorously oppose the action.

The complaint described a situation in which Allen-Babcock was caught in a severe financial pinch with most of its customer data files and software on a Tymshare computer.

Real Intent Questioned

Allen-Babcock charged in the suit that the situation was intentionally created and a merger was not the real intent of Tymshare.

The complaint alleged Tymshare conspired "for the express purpose of acquiring the business, trade secrets, customers and key technical personnel" without paying.

The main thrust, the complaint said, was "to delude plaintiff into the belief that Tymshare intended consummating a merger with plaintiff, so that plaintiff would not seek alternate mergers into or acquisitions by other companies while Tymshare progressively took control over plaintiff's affairs . . ."

Allen-Babcock, in its complaint, charged a series of "stratagems" were used:

- "As the price exacted for the interim financial assistance which Tymshare was providing, Tymshare took over the management and control of plaintiff's financial affairs, thereby obtaining a stranglehold on plaintiff . . ."
- Tymshare "instructed and directed" Allen-Babcock to transfer its software and customer data files at its Palo Alto main data center to its new 370/158.

Tymshare, the complaint alleged, "ordered and directed" that the telephone lines at Allen-Babcock's data center in Union, N.J., be transferred to Tymshare's data center in Union, N.J.,"facilitating the takeover of customers when the merger collapsed."

Tymshare's time-sharing computer network was connected to Allen-Babcock's New York office, "thereby enabling and facilitating Tymshare's takeover of plaintiff's customers when defendants consummated the conspiracy by collapsing the merger," according to the complaint.

Allen-Babcock's key technical personnel were directed to install and start up Tymshare's 370/158, to "create an atmosphere in which plaintiff's key employees would naturally gravitate to and seek employment by Tymshare" when the merger collapsed.

Certain Allen-Babcock customers were solicited by Tymshare, the complaint said, so as "to erode plaintiff's revenues. . ."

Retailers Urged to View POS as Complete System

By Marvin Smalheiser
CW West Coast Bureau

LOS ANGELES – The point-of-sale (POS) revolution is not in the future but now; and retailers should see their POS system "as a complete data processing and communications system, not just as an interconnected set of cash register drawers."

That was the message of Mosee Shapiro, chairman of the board of General Instrument Corp., in the keynote address at the 15th annual Retail Electronic Data Processing Conference of the National Retail Merchants Association.

"What the POS revolution is really all about is the employment of advanced information-handling technology to communicate more effectively with the transactions occurring on the selling floor: "To distill out of the chaos of the thousands upon thousands of transactions those particular messages you need to hear and understand right now."

Reliability is crucial and all potential system malfunctions must be anticipated in the light of their potential impact on the business of retailing, Shapiro said.

"Data can be recaptured; a lot sale, or in some cases a dissatisfied customer, cannot," he warned.

It is "of critical importance" to select a system that affords a high degree of flexibility.

J. Edward Miller, national manager of data processing for Sears Roebuck and Co., said the future of retail operations is through POS, but "at this stage of technology, I am not convinced that effective inventory control requires the timeliness and justifies the cost of on-line computing." Miller spoke at the opening day luncheon.

However, he said, "it may be feasible with in-store POS equipment to price some lines of merchandise in an on-line manner."

User Involvement Needed for POS

LOS ANGELES – A point-of-sale system will give a retailer an important competitive edge, but only if it is effectively planned with the involvement of the people who will make it work.

Four specialists in POS and EDP emphasized this in a panel here this week at the National Retail Merchants Association conference.

Roy Burns, director of total systems development at Dayton's, Minneapolis, suggested the use of an effective task force led by a project leader to implement POS.

"Stay as loose as possible and think and plan modularly," he said.

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DPF Reports Earnings Up in 1st Quarter

WHITE PLAINS, N.Y. – DPF Inc. reported an improved financial picture to shareholders at the recent annual meeting here.

"The possibility of additional growth opportunities through acquisition seems promising," President Bertram J. Cohn observed.

In the first quarter ended Aug. 31, the firm reported earnings of $155,000 or 4 cents a share, after a special credit of $206,000 from repurchase of debentures.

In the year-ago period, DPF showed earnings of $20,000, after a $20,000 special credit.

In the same 1971 quarter, DPF lost $34.3 million as a result of a change in depreciation policy and adopted a break-even accounting basis for revenues from the System 360 portfolio.

Revenues declined to $7.7 million from $8.9 million in the year-ago period ended Aug. 31.

First quarter revenues exceeded related costs by $539,000 in 1973 and $1 million in 1972. These amounts have been included in depreciation to offset projected future excess costs over revenues, the firm said.

All of the firm's CPUs are on rent, as they were at the end of the fiscal year in May, Cohn noted.

Reduced Off-Rent Position

During the year ended in May, the firm reduced the off-rent position of its total portfolio from $4.3% to 2.8%, and the average remarketed lease term has been increased to 24 months, according to Michael Creedon, executive vice-president, marketing.

DPF reduced the equipment coming off lease and remarketed 33.5% of its total portfolio compared with 36.6% in fiscal 1972, he said.

In addition, the firm reduced its cost of remarketing equipment from 6% of the original equipment cost to about 1.5%.

Creedon said lease terminations declined from $78 million to about $67 million.

Speaking of the firm's 370 leasing program, Creedon noted DPF has entered into a marketing agreement with Memorex, and is "presently negotiating to add high-speed tape drives, IBM 3330-compatible disk storage drives, and a new independent memory for this program."

Cohn observed that during the year ended May 31, the firm had reduced its overall bank and secured debt to $12.5 million from $32.4 million.

During the first quarter, the firm increased its investment in short-term commercial paper and marketable securities by $4.2 million rather than continuing the prepayment of its IBM secured debt.

Interest earned on commercial paper exceeded the secured debt rate by about 1.5%, Cohn added.

Calcomp Jumps Into Black for 1973

ANAHEIM, Calif. – With help from a healthy fourth quarter, California Computer Products, Inc. showed earnings of $465,000 or 16 cents a share for the year, overcoming a first quarter deficit of $2.3 million. The year's earnings contrast with a loss of $12.9 million or $4.72 a share in 1972.

Revenues were up 49% to $80.3 million from $53.9 million a year ago.

In the fourth quarter, earnings totaled $1.1 million or 37 cents a share and revenues reached a record $25.3 million.

President Lester L. Kilpatrick said he expects revenues for the current fiscal year to top $100 million based on current operating levels and backlog.

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TEXAS INSTRUMENTS
INCORPORATED

Toward the Bottom Line

Cordura's board of directors authorized the purchase of up to one million shares of its outstanding common stock, to be used for possible future acquisitions, employee benefit programs and stock option plans.

$$$

Dearborn-Storm has declared a regular quarterly cash dividend of six cents a share to be paid Oct. 26 to shareholders of record Oct. 5.

$$$

National Liberty Corp. plans to acquire the minority holdings of its 59% owned subsidiary, National Information Systems Corp. The NIS board endorsed the proposed tender in principle. Price and terms have not been determined.

$$$

Analytical Development Associates Corp., Cupertino, Calif., has received $400,000 in equity financing from the private sale of preferred stock. Proceeds will be used to expand its Medinet medical communications system.

$$$

The Palmer Organization of Boston has invested $100,000 in American Systems, maker of voice response time-sharing systems for the handicapped and $300,000 in Dynastor, developer of a flexible disk unit.

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Earnings Reports

ANDERSON JACOBSON
Three Months Ended June 30

	1973	1972
Shr Ernd	$.04	$.03
Revenue	1,921,023	1,197,252
Spec Cred	.....	a36,694
Earnings	91,925	87,512

a-From sale of land.

ANALYSTS INTERNATIONAL
Year Ended June 30

	1973	1972
Shr Ernd	$.21	$.12
Revenue	3,100,000	2,200,000
Earnings	179,000	98,000

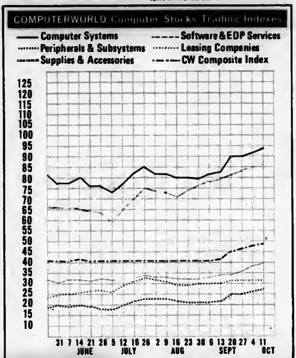
MATHEMATICAL APPLICATIONS GROUP
Three Months Ended June 30

	1973	1972
Shr Ernd	$.02	$(.08)
Revenue	885,795	414,208
Earnings	13,315	(66,719)

ON-LINE SYSTEMS
Three Months Ended July 31

	1973	1972
Shr Ernd	$.33	a$.13
Revenue	1,897,031	1,262,940
Earnings	262,752	105,420

a-Adjusted for a three-for-two stock split in March 1973.



ADDRESSOGRAPH-MULTIGRAPH
Year Ended July 31

	1973	1972
Shr Ernd	$.55	$2.07
Revenue	489,849,000	441,555,000
Spec Chg	a11,357,000	.....
Earnings	4,443,000	15,849,000

a-Consists of provisional charge of about $12.6 million for domestic accounts receivable and inventory adjustments in the third and fourth quarters, less about a $1.2 million credit from sale of plant and devaluation of the U.S. dollar.

IPS COMPUTER MARKETING
Nine Months Ended May 31

	1973	1972
Shr Ernd	$.35	$.43
Revenue	7,371,281	4,263,147
Earnings	169,710	117,565

SDL
Year Ended June 30

	1973	1972
Shr Ernd	$.75	.....
Revenue	9,900,000	$5,800,000
Earnings	1,500,000	(434,000)

MOHAWK DATA SCIENCES
Three Months Ended July 31

	a1973	1972
Shr Ernd	.....	$.05
Revenue	$40,970,000	33,466,000
Earnings	(1,311,000)	289,000

a-Includes results of Elestolabs Corp. and Computing Efficiency Inc. acquired January and March 1973, respectively.

GENERAL INSTRUMENT
Three Months Ended Aug. 26

	1973	a1972
Shr Ernd	$.49	b$.30
Revenue	106,005,002	76,827,177
Earnings	3,741,635	2,489,780
6 Mo Shr	.85	0.50
Revenue	201,376,755	148,099,659
Earnings	6,577,969	4,272,522

a-Restated to reflect subsequent pooling-of-interests. b-Adjusted for a 2% stock dividend paid in May 1973.

ANALOG DEVICES
Three Months Ended Aug. 4

	1973	1972
Shr Ernd	$.26	$.20
Revenue	5,747,787	4,088,314
Earnings	346,393	261,168
10 Mo Shr	.72	.50
Revenue	15,622,164	11,332,842
Earnings	961,909	656,883

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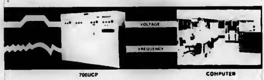

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Computerworld Stock Trading Summary

All statistics compiled, computed and formatted by TRADE*QUOTES, INC. Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		1973 RANGE (1)	CLOSE OCT 10 1973	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	211-245	227 3/4	+ 5/8	+0.2
N	COLLINS RADIO	18- 26	24 5/8	+ 1/8	+0.5
O	COMPUTER AUTOMATION	5- 18	18 1/8	+1 1/8	+8.2
N	CONTROL DATA CORP	31- 62	45 3/8	- 5/8	-1.3
O	DATA GENERAL CORP	28- 46	43 3/4	-1 1/2	-3.3
O	DATAPOINT CORP	10- 21	17 1/2	- 1/8	-0.7
O	DIGITAL COMP CONTROL	2- 6	3 1/8	0	0.0
N	DIGITAL EQUIPMENT	73-105	99 7/8	+1 3/8	+1.3
N	ELECTRONIC ASSOC.	4- 9	6	+ 1/8	+2.1
A	ELECTRONIC ENGINEER.	6- 13	11 1/2	+ 1/2	+4.5
N	FOXBORO	23- 45	42 3/8	-1 5/8	-3.8
O	GENERAL AUTOMATION	22- 55	38 1/2	0	0.0
O	GRI COMPUTER CORP	1- 3	1 5/8	+ 1/8	+8.3
N	HEWLETT-PACKARD CO	73- 95	93 1/2	+2 3/4	+3.0
N	HONEYWELL INC	98-139	110 1/4	- 1/8	-0.1
N	IBM	249-348	274	+22 1/2	+8.9
O	INTERDATA INC	7- 14	13 1/4	+ 1/4	+1.9
N	MEMOREX	2- 18	4 1/8	+ 1/4	+6.4
O	MICRODATA CORP	2- 10	3 3/8	- 1/8	-3.5
N	NCR	27- 43	41 1/4	0	0.0
N	RAYTHEON CO	22- 34	31	- 1/2	-1.5
N	SINGER CO	45- 74	58 3/8	+2 3/8	+4.2
N	SPERRY RAND	36- 54	52 5/8	+ 1/4	+0.4
A	SYSTEMS ENG. LABS	3- 8	3 1/4	+ 1/4	+8.3
N	TEXAS INSTRUMENTS	83-132	131	+5 3/4	+4.5
O	ULTIMACC SYSTEMS INC	1- 11	2 3/8	0	0.0
N	VARIAN ASSOCIATES	10- 20	16	-1 1/4	-7.2
N	WANG LABS.	13- 34	27 1/2	- 3/4	-2.8
N	XEROX CORP	138-169	141 5/8	+3 7/8	+2.8

LEASING COMPANIES

EXCH		1973 RANGE (1)	CLOSE OCT 10 1973	WEEK NET CHNGE	WEEK PCT CHNGE
A	BOOTHE COMPUTER	0- 8	1 1/8	0	0.0
O	BRESNAHAN COMP.	1- 2	2 1/8	0	0.0
O	COMDISCO INC	6- 17	7 3/4	0	0.0
O	COMMERCE GROUP CORP	3- 4	3 1/2	0	0.0
O	COMPUTER EXCHANGE	1- 1	1/4	0	0.0
A	COMPUTER INVSTRS GRP	2- 8	3 1/4	+ 3/8	+13.0
O	COMP. INSTALLATIONS	1- 2	1	0	0.0
N	DATRONIC RENTAL	2- 3	2 1/4	- 1/8	-5.2
A	DCL INC	1- 3	7/8	- 1/8	-12.5
P	DEARBORN-STORM	12- 26	17 1/8	+1 7/8	+12.2
N	DPF INC	5- 9	5 1/8	- 1/8	-2.3
O	EDP RESOURCES	1- 3	1 1/4	0	0.0
A	GRANITE MGT	2- 6	3 5/8	- 3/4	-17.1
A	GREYHOUND COMPUTER	3- 8	4 3/4	+ 5/8	+15.1
A	ITEL	4- 12	5 5/8	- 3/8	-6.2
N	LEASCO CORP	8- 18	13 1/8	0	0.0
O	LEASPAC CORP	1- 8	1 1/4	0	0.0
O	LECTRO MGT INC	1- 2	5/8	0	0.0
O	NRG INC	5- 15	6 1/4	- 1/8	-1.9
A	PIONEER TEX CORP	5- 8	5 3/4	+ 1/8	+2.2
A	ROCKWOOD COMPUTER	1- 3	1 1/4	0	0.0
N	U.S. LEASING	16- 36	25	-1 3/8	-5.2

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
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SOFTWARE & EDP SERVICES

EXCH		1973 RANGE (1)	CLOSE OCT 10 1973	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 2	2 1/4	+ 3/4	+50.0
A	APPLIED DATA RES.	2- 4	2 1/8	- 1/8	-5.5
O	APPLIED LOGIC	1- 3	5/8	- 1/4	-28.5
N	AUTOMATIC DATA PROC	38- 84	75 1/4	+ 1/4	+0.3
O	BRANDON APPLIED SYST	1- 1	1/4	0	0.0
O	CENTRAL DATA SYSTEMS	8- 9	6 1/2	0	0.0
O	COMPUTER DIMENSIONS	2- 5	3 1/2	+ 1/2	+16.8
O	COMPUTER DYNAMICS	1- 2	1/2	+ 1/8	+33.3
O	COMPUTER HORIZONS	1- 6	3 1/4	- 1/4	-7.1
O	COMPUTER NETWORK	1- 5	1	0	0.0
N	COMPUTER SCIENCES	2- 6	3 1/4	- 1/8	-3.7
O	COMPUTER TASK GROUP	1- 2	1 1/2	0	0.0
O	COMPUTER TECHNOLOGY	1- 3	1	0	0.0
O	COMPUTER USAGE	4- 9	5 3/8	- 1/8	-2.2
O	COMRESS	1- 2	1/2	0	0.0
O	COMSHARE	4- 8	4 1/2	+ 1/4	+5.8
N	CORDURA CORP	4- 15	4 7/8	- 1/2	-9.3
O	CYBERMATICS INC	1- 3	1 5/8	0	0.0
O	DATATAB	1- 4	1 1/2	0	0.0
A	ELECT COMP PROG	1- 2	1	- 1/8	-11.1
N	ELECTRONIC DATA SYS.	29- 56	38 3/4	- 5/8	-1.5
O	INFONATIONAL INC	1- 2	5/8	- 1/8	-16.6
O	INFORMATICS	2- 6	5 1/2	- 1/8	-2.2
O	I.D.A. DATA CORP	1- 1	5/8	0	0.0
O	IMS COMPUTER MARKET.	1- 5	1 7/8	+ 1/8	+7.1
O	KEANE ASSOCIATES	3- 5	4 1/2	- 3/4	-14.2
O	KEYDATA CORP	4- 12	6	0	0.0
O	LOGICON	3- 7	3 7/8	0	0.0
A	MANAGEMENT DATA	2- 5	2 1/8	0	0.0
O	NATIONAL CSS INC	18- 42	28	-1	-3.4
O	NATIONAL COMPUTER CO	1- 1	3/8	0	0.0
O	NATIONAL INFO SRVCS	1- 2	1/2	0	0.0
M	ON LINE SYSTEMS INC	12- 21	22 3/4	+1 3/4	+0.3
N	PLANNING RESEARCH	2- 7	4	+ 7/8	+28.0
O	PROGRAMMING METHODS	21- 25	21	0	0.0
O	PROGRAMMING & SYS	1- 1	3/4	+ 1/8	+20.0
O	RAMDATA INC	5- 24	5	+ 1/8	+2.5
O	SCIENTIFIC COMPUTERS	1- 3	3/4	0	0.0
O	SIMPLICITY COMPUTER	1- 4	1 1/4	0	0.0
O	7RS COMPUTER CENTERS	2- 8	5 1/2	0	0.0
O	TCC INC	1- 1	3/8	0	0.0
O	TYMSHARE INC	8- 13	11 1/2	- 1/2	-4.1
O	UNITED DATA CENTER	3- 6	3 1/2	0	0.0
A	URS SYSTEMS	4- 8	4 3/8	- 1/4	-5.4
P	WYLY CORP	4- 11	5 3/4	+ 1/2	+9.5

PERIPHERALS & SUBSYSTEMS

EXCH		1973 RANGE (1)	CLOSE OCT 10 1973	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	12- 34	17	- 3/8	-2.1
O	ADVANCED MEMORY SYS	5- 23	8 3/4	+ 3/4	+9.3
N	AMPEX CORP	4- 7	5 1/2	- 1/8	-2.2
O	ANDERSON JACOBSON	3- 6	3 1/4	+ 1/4	+8.3
O	BEEHIVE MEDICAL ELEC	5- 10	7	-1	-12.5
A	BOLT,BERANEK & NEW	6- 12	10	+ 1/4	+2.5
N	BUNKER-RAMO	6- 18	11 3/8	- 3/8	-3.1
A	CALCOMP	5- 15	13	-2	-13.3
O	CAMBRIDGE MEMORIES	8- 17	15 1/2	- 1/2	-3.1
O	CENTRONICS DATA COMP	13- 38	31	+ 1/2	+1.6
O	CODEX CORP	8- 19	16	0	0.0
O	COGNITRONICS	1- 3	1 1/2	+ 1/4	+20.0
O	COMPUTER COMMUN.	1- 4	5/8	0	0.0
A	COMPUTER EQUIPMENT	2- 3	2 1/8	0	0.0
O	COMPUTER MACHINERY	5- 13	7 1/2	- 3/8	-4.7
O	COMPUTER TRANSCEIVER	1- 6	1 1/2	- 1/8	-7.6
N	CONRAC CORP	15- 32	22 1/4	+ 1/2	+2.2
O	DATA ACCESS SYSTEMS	1- 3	2	0	0.0
O	DATA 100	9- 19	17	- 1/2	-2.8
A	DATA PRODUCTS CORP	2- 5	4 1/2	+ 3/4	+20.0
O	DATA RECOGNITION	2- 3	1 1/2	0	0.0
O	DATA TECHNOLOGY	2- 5	2 1/4	- 3/8	-14.2
O	DECISION DATA COMPUT	8- 40	12 3/4	+ 1/4	+2.0
O	DELTA DATA SYSTEMS	1- 1	3/8	0	0.0
O	DIMAN CONTROLS	1- 4	3	- 1/4	-7.8
N	ELECTRONIC M & M	3- 6	5	0	0.0
O	FABRI-TEK	2- 5	3 1/2	- 1/8	-3.4
O	GENERAL COMPUTER SYS	5- 8	7	+ 1/4	+3.7
N	GENERAL ELECTRIC	58- 76	66 1/2	+2 1/4	+3.5
N	HAZELTINE CORP	5- 9	6 5/8	- 1/8	-1.8
O	INFOREX INC	5- 23	6 3/8	+ 3/4	+13.3
O	INFORMATION DISPLAYS	1- 2	3/8	0	0.0
O	INFORMATION INTL INC	10- 15	12 3/4	- 1/4	-1.9
A	LUNDY ELECTRONICS	3- 9	3 7/8	- 1/8	-3.1
O	MANAGEMENT ASSIST	1- 1	3/8	0	0.0
A	MILGO ELECTRONICS	14- 28	24 7/8	+3 1/8	+14.3
N	MOHAWK DATA SCI	4- 13	6	0	0.0
O	ODEC COMPUTER SYST.	2- 6	3	+1 1/8	+60.0
O	OPTICAL SCANNING	2- 8	5	0	0.0
O	PERTEC CORP	4- 8	8 1/2	- 1/8	-1.0
O	PHOTON	3- 7	3 3/4	0	0.0
A	POTTER INSTRUMENT	3- 9	5 1/8	+ 1/8	+2.5
O	PRECISION INST.	2- 6	4 1/2	+ 1/2	+12.5
O	QUANTOR CORP	5- 18	5 3/4	- 1/4	-4.1
O	RECOGNITION EQUIP	4- 8	4 1/4	+ 1/4	+6.2
N	SANDERS ASSOCIATES	7- 18	11 1/2	- 1/4	-2.1
O	SCAN DATA	1- 6	3 3/4	- 1/8	-3.2
O	STORAGE TECHNOLOGY	11- 34	20 7/8	- 1/8	-0.5
O	SYCOR INC	9- 20	18 3/4	0	0.0
O	TALLY CORP.	2- 14	4 1/4	- 1/4	-5.5
O	TEC INC	6- 9	8 3/4	0	0.0
N	TEKTRONIX INC	30- 53	52 1/4	+1 1/8	+2.2
N	TELEX	3- 8	5	-1 1/8	-18.3
O	WANGCO INC	7- 13	12 3/4	+1	+8.5
O	WILTEK INC	8- 18	10	- 1/2	-4.7

SUPPLIES & ACCESSORIES

EXCH		1973 RANGE (1)	CLOSE OCT 10 1973	WEEK NET CHNGE	WEEK PCT CHNGE
O	BALTIMORE BUS FORMS	5- 8	5 3/4	+ 3/4	+15.0
A	BARRY WRIGHT	6- 13	7 3/4	- 1/4	-3.1
A	DATA DOCUMENTS	17- 26	23	- 3/4	-3.1
O	DUPLEX PRODUCTS INC	7- 10	8 1/2	+ 1/8	+1.6
N	ENNIS BUS. FORMS	5- 8	8 7/8	- 3/8	-5.1
O	GRAHAM MAGNETICS	9- 20	14 1/2	+ 3/4	+5.4
O	GRAPHIC CONTROLS	8- 12	9 1/4	+ 1/8	+1.3
N	3M COMPANY	78- 91	86 3/8	+1 1/8	+1.3
O	MOORE CORP LTD	53- 60	59	+ 3/4	+1.2
P	NASHUA CORP	42- 58	52 1/8	+ 3/8	+0.7
O	REYNOLDS & REYNOLDS	40- 51	45 1/4	-1 1/2	-3.2
O	STANDARD REGISTER	14- 28	16	- 1/4	-1.5
O	TAB PRODUCTS CO	8- 23	11 1/2	0	0.0
N	UARCO	15- 23	17 1/4	- 1/4	-1.4
A	WABASH MAGNETICS	5- 8	7 1/2	+ 1/2	+7.1
P	WALLACE BUS FORMS	15- 28	21 1/4	0	0.0

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